Appendix F
Additional Statewide Indicators Narrative

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Maternal and Infant Health

Adequacy of Prenatal Care

Entry to prenatal care (PNC) in the first trimester of pregnancy is recommended because of its potential to improve the health of mothers and infants. Early initiation of prenatal care can lead to early access to vital preventive health services as well as screening, monitoring and, when necessary, treatment for health issues related to pregnancy.[1] The Adequacy of Prenatal Care Utilization (APNCU) Index describes several aspects of PNC, including the timing of entry to care and the amount of care received. The HP 2010 target is that at least 90% of women receive PNC before the end of the first trimester of pregnancy. In Massachusetts, according to birth certificate data:

- In 2008, 81% of women received care beginning in the first trimester and 82.1% of women received adequate intensive and basic prenatal care[1]
- Both percentages are within 25% of the HP 2010 target of 90% for both variables
- Massachusetts Pregnancy Risk Assessment Monitoring System (MA PRAMS) data also provide information on prenatal care among Massachusetts mothers. The PRAMS survey assessed when women knew that they were pregnant and when they began their prenatal visits. The following statistics highlight 2007/2008 MA PRAMS findings on adequacy of prenatal care[2]:
  - Prevalence of inadequate or no prenatal care was higher among Hispanic (14.4%) and Black, non-Hispanic (14.3%) compared to White, non-Hispanic (7.9%) mothers
  - Mothers aged < 20 years (30.1%) were more likely to report inadequate or no prenatal care compared to mothers aged 30-39 years (6.1%)
  - Mothers with less than high school education (21.3%) were significantly more likely to report inadequate or no prenatal care compared to mothers with high school diplomas (11.4%), some college (8.5%) and college graduates (6.3%)
  - Mothers living at or below 100% FPL (17.9%) were more likely to have received inadequate or no prenatal care than mothers living above 100% of FPL (7.2%)
  - Mothers with Medicaid (15.7%) were more likely to have received inadequate or no prenatal care than mothers not on Medicaid (6.4%)

Five years of birth certificate data were examined to determine which Massachusetts communities had the highest percentage of women giving birth with inadequate prenatal care. Statewide, 16.5% of women received inadequate prenatal care.[3] Four of the five towns with the highest rates of inadequate prenatal care are small rural towns with fairly low numbers of births. All five towns are located in the Berkshires in Western Massachusetts and include:

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[1] Adequate Intensive is defined as beginning prenatal care in the first trimester and receiving 110% or more of expected prenatal care visits. Adequate Basic is defined as beginning prenatal care in the first or second trimester and receiving 80% - 109% of expected prenatal care visits.

1. Tyringham: 71.4%
2. Alford: 45.5%
3. Hinsdale: 36.1%
4. Pittsfield: 34.1%
5. Washington: 33.3%

Breastfeeding

Exclusive breastfeeding for the first 6 months of life is recognized as the best and most complete source of nourishment for most infants. Such exclusivity for the first 6 months is further associated with lowered risk of infections and certain chronic diseases for infants and is shown to have substantial health benefits for mothers as well.[4] According to data from the 2008 Pediatric Nutrition Surveillance System (PedNSS), which represents approximately 8.2 million low-income children aged birth to 5 years across the country, Massachusetts ranked 11th in the Nation in mothers reporting ever breastfeeding their child (72.1% of Massachusetts mothers versus 59.8% of mothers nationwide). This measure has consistently increased since 1999, when it was 58.6%.[5,6]

2008 Massachusetts data from PedNSS also indicate:

- The prevalence of Hispanic infants who were ever breastfed increased from 71.1% in 1999 to 80.5% in 2008
- The prevalence of ever breastfeeding among MA PedNSS infants has also increased among Black, non-Hispanic infants, from 68.1% in 1999 to 82.6 % in 2008, the largest improvement for breastfeeding initiation of any racial group
- The greatest proportion of infants to be ever breastfed in 2008 MA PedNSS was observed among Black, non Hispanic infants (82.6%), surpassing Hispanic infants and other race groups
- The overall proportion of infants in 2008 MA PedNSS that were breastfeed for at least six months was 27.3% (compared with 25.4% nationally)
- The greatest prevalence in breastfeeding for at least six months occurred among Black, non-Hispanic infants (38.2%), followed by Hispanic (30.9%), Asian (26.3%), and White non-Hispanic (21.0%) infants
- Neither Massachusetts infants nor their national counterparts met the HP 2010 goal of breastfeeding for at least six months, which was set at 50%.

According to 2007/2008 MA PRAMS data[7]:

- An estimated 81.6% of Massachusetts mothers reported initiating breastfeeding, which exceeds the HP 2010 goal of 75% initiation
- Non-U.S. born mothers had a higher prevalence of ever breastfeeding (92.5%) than U.S.-born mothers (77.1%)

Five years of birth certificate data were examined to determine communities with lowest rates of breastfeeding initiation. From 2004 – 2008, 20.0% of women giving birth in Massachusetts indicated at delivery that they were not intending to breastfeed their infants.[8] The towns with the highest rates of mothers not intending to breastfeed their infants were:

1. Tyringham (Berkshires): 71.4%

2. Fall River (Southeast): 50.5%
3. Adams (Berkshires): 41.7%
4. New Bedford (Southeast): 41.8%
5. North Adams (Berkshires): 41.5%

Smoking

Smoking presents multiple hazards to the health of mothers and infants. Smoking during pregnancy has been associated with preterm birth, low birth weight, stillbirth and infant mortality. Smoking may also be associated with pregnancy complications including placenta previa and placental abruption.[9] Massachusetts has data regarding current smoking among women of childbearing age from the Behavioral Risk Factor Surveillance System (BRFSS) and about smoking during pregnancy from MA PRAMS and birth certificate data.

- Among all women aged 18-44 years during 2006-2008, the prevalence of current smoking was highest (22.6%) among women aged 18-24 years with the prevalence in all other age groups ranging from 16.4 to 21.3%[10]
- The percentage of women who did not report smoking during pregnancy on their child's birth certificate was 93.1% in 2008, placing Massachusetts within 25% of the HP 2010 goal of 99%[11]
- The percentage of Massachusetts mothers reporting smoking during pregnancy decreased over 64.4% from 19.3% in 1990 to 6.9% in 2008[12]
- The highest rates of smoking during pregnancy were among White, non-Hispanics (8.1%) compared to 5.1% among Black, non-Hispanics, 4.8% among Hispanics, and 1.5% among Asian/Pacific Islanders[13]

According to 2007/2008 MA PRAMS data:

- 9.3% of mothers used tobacco during their last 3 months of pregnancy
- 18.9% used tobacco in the past 2 years
- 17.6% used tobacco within 3 months prior to pregnancy
- 12.6% used tobacco within the 2 to 6 months following the birth of their child[14]

Birth certificate data indicate the following regarding smoking habits during pregnancy among Massachusetts mothers in 2008[15]:

- Among the 8.4% of Massachusetts women who reported being light smokers (1-10 cigarettes daily) prior to pregnancy, 62.4% quit smoking, 37.2% remained light smokers and 0.03% increased their smoking frequency during pregnancy
- Among the 4.7 % of Massachusetts women who reported being moderate smokers (11-10 cigarettes daily) prior to pregnancy, 31.5% quit smoking, 53.6% reported light smoking and 14.7 % remained moderate smokers during pregnancy
- Among the 0.5% of Massachusetts women who reported being heavy smokers (21 cigarettes or more daily) prior to pregnancy, 15.2% quit smoking, 48.9% reported light smoking, 29.8 % reported moderate smoking and 6.1% remained heavy smokers during pregnancy

Five years of birth certificate data were examined to identify communities with highest rates of smoking during pregnancy. From 2004 – 2008, 7.3% of mothers giving birth in

the Commonwealth indicated that they smoked during their pregnancies.[16] The towns with the highest rates of smoking during pregnancy were all in the Berkshires, and included:

1. Leyden: 35.3%
2. North Adams: 33.7%
3. Adams: 29.7%
4. Pittsfield: 25.6%
5. Warren: 23.8%

Healthy Weight: Overweight and Obesity

Being overweight prior to pregnancy increases the risk for gestational diabetes mellitus (GDM) and poor outcomes for both mothers and their infants. Being underweight prior to pregnancy increases the risk of infertility, anemia, small for gestational age infants, and complications during childbirth.

According to 2006-2008 BRFSS data, the prevalence of overweight and obesity were 41.8% and 17.2%, respectively, among Massachusetts women aged 18-44 years.[17] MA PRAMS data indicate that during 2007/2008, 21.7% of mothers were overweight and 16.6% were obese prior to their most recent pregnancy.[18] Looking more closely at available data highlights existing disparities in the prevalence of overweight and obesity among women of childbearing age (18 -44 years) across racial and ethnic groups:

- The prevalence of overweight was highest among Black, non-Hispanics (62.0%), followed by Hispanics (54.1%), White, non-Hispanics (40.0%) and Asian/Pacific Islanders (20.0%)[19]
- The prevalence of obesity was highest among Black, non-Hispanics (31.3%), followed by Hispanics (23.2%), and White, non-Hispanics (16.2%). Due to small numbers, data Asian/Pacific Islanders can not be reported[20]

In addition to weight status, the following data from the 2006-2008 BRFSS highlight current trends in factors associated with maternal healthy weight, specifically physical activity and fruit and vegetable consumption, among Massachusetts women of childbearing age:[21]

- According to, among Massachusetts women aged 18-44 years, the overall prevalence of any leisure time physical activity was 80.9%
- The prevalence of any leisure time physical activity was highest among White, non-Hispanics (85.5%), followed by Asians (72.2), Black, non-Hispanics (71.9%), and Hispanics (58.1%)
- The overall prevalence of moderate physical activity was 55.8%
- The prevalence of any moderate physical activity was highest among White, non-Hispanics (59.2%), followed by Black, non-Hispanics (46.7%), Hispanics (43.9%), and Asians (36.5)
- Less than one third, 30.8%, of female Massachusetts residents aged 18-44 years reported eating five or more servings of fruits/vegetables a day
- The prevalence of sufficient fruit/vegetable intake was lowest among Black, non-Hispanic women (22.2%) and Hispanic women (24.9%), as compared to White, non-Hispanic (31.6%) and Asian (36.3%) women

Maternal Substance Abuse

Substance abuse during pregnancy can have serious adverse consequences for both mother and infant. The use of illicit drugs or the misuse of prescription medication can increase the likelihood of miscarriage, stillbirth, and poor fetal growth. Children born to mothers who used these drugs during pregnancy often have behavioral problems and learning difficulties. Some researchers believe that the father's drug use before conception might also increase the chances of birth defects in their children. Therefore, being drug-free is important before, during and after pregnancy for both parents.[22]

During 2008, there were 753 pregnant women admitted to substance abuse treatment programs in Massachusetts, which equaled less than 1% of total admissions.[23] While the number of primary admissions for pregnant women decreased from approximately 800 to 500 cases per year between 1997 and 2001, since 2001 the number of primary admissions for pregnant women has increased to 753 cases in 2008.

Of the 753 female admissions to substance abuse treatment programs in 2008:

- 77.8% (585) were White, non-Hispanic, 6.4%(48) were Black, non-Hispanic, 11.2% (84) were Latina, 6.8% (51) were other single race, and 9.0% (68) were multi-racial
- 88.6% (667) were unemployed
- 58.3% (439) were aged 21-29 years
- 51.7% (389) had received prior mental health treatment
- 34.0% (250) were the parents of children aged 6-18 years (21.3% of which reported living with their children)
- 24.9% (309) had children aged < 6 years (36.0% of which reported living with their children)
- 24.3% (183) were homeless

Heroin was the most common primary substance of use reported in 53.3 % (401) of female admissions, followed by alcohol in 13.8% (104), cocaine or crack in 13.4% (101), marijuana in 4.7% (35), and other drugs in 14.9% of admissions.

Maternal Alcohol Use

The consumption of alcohol during pregnancy can lead to negative health and developmental complications associated with the Fetal Alcohol Spectrum Disorders (FASD). While the hazards of heavy drinking during pregnancy are well known, no amount of alcohol during pregnancy has been established as safe for the fetus.[24] In 2008, of the 753 pregnant women aged 18 years and older who were admitted to substance abuse treatment services, 104 (13.8%) reported alcohol as the primary substance of use.[25]

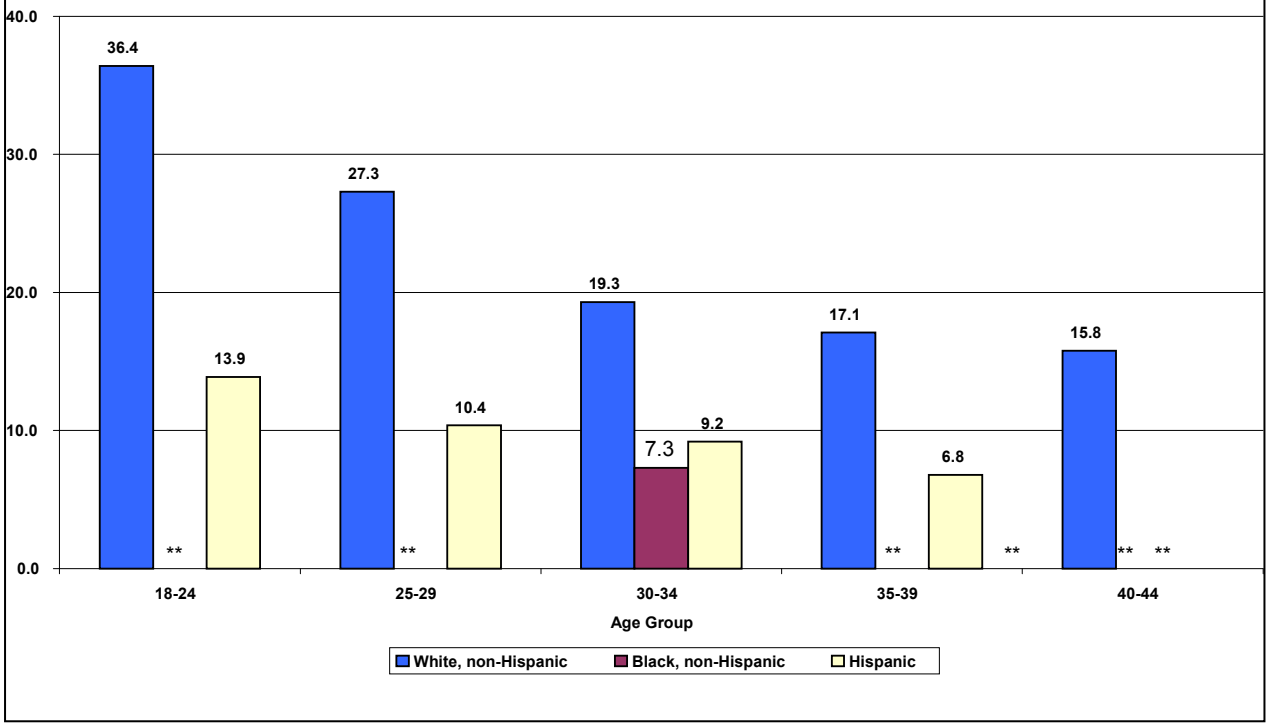
Data from the 2006-2008 Massachusetts BRFSS provided the following statistics regarding the prevalence of binge drinking (defined as the consumption of 5 or more drinks on any one occasion in the past month) and heavy drinking (defined for women as the consumption of more than 30 drinks in the past month) among women of childbearing age:[26]

- Among women aged 18-44 years, 5.8% reported heavy drinking and 18.5% reported binge drinking
- White, non-Hispanic women demonstrated consistently higher prevalence of binge drinking compared to Black, non-Hispanic, and Hispanic women [See Figure 1 below]

According to 2007/2008 PRAMS data[27]:

- 71.1% of mothers reported ever using alcohol in the past 2 years
- 60.9% reported using alcohol in the three months prior to becoming pregnant
- 11.3% reported using any alcohol in the last three months of pregnancy
- 0.6% reported any alcohol binging during the last 3 months of pregnancy

Figure F.1: Prevalence of Binge Drinking in past 30 days Among MA Females Ages 18-44 by Age Group and Race/Ethnicity, 2007- 2009 (aggregate)



Maternal Death and Pregnancy-Associated Death

The Massachusetts Maternal Mortality and Morbidity Review Committee (MMMRC) reviews maternal deaths, examines the incidence of pregnancy complications, and makes recommendations to improve maternal outcomes and prevent mortality. Maternal death, while rare, is a critical health indicator for women giving birth. Furthermore, in Massachusetts, the leading causes of maternal death have also shifted from infections, pregnancy-induced hypertension, cardiac disease and hemorrhage to injury (suicide, homicide, and motor vehicle crashes) and pulmonary embolus.

Pregnancy-associated death is defined as any death of a woman while pregnant or within one year of termination of pregnancy, irrespective of cause. Maternal deaths are defined

as a death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of site or duration of pregnancy, from any cause related to or aggravated by pregnancy and its management (not from accidental or incidental cause). There has been a dramatic decrease in maternal mortality in Massachusetts during the last half of this century:

- In 2008, the Massachusetts maternal mortality ratio (MMR) was 10.3 per 100,000 occurrence live births, which is significantly higher than the 2000 rate of 1.2 per 100,000 live occurrence births. [See Figure F.2 below]. It is more than 25% higher than the HP 2010 target of 3.3 per 100,000 live births[28]
- In 2008, there were 23 pregnancy-associated deaths, including 8 maternal deaths.[29] The pregnancy-associated mortality ratio (PAMR) for Massachusetts was 29.7 per 100,000 live occurrence births, which is up significantly from its low of 16 per 100,000 live occurrence births in 2004

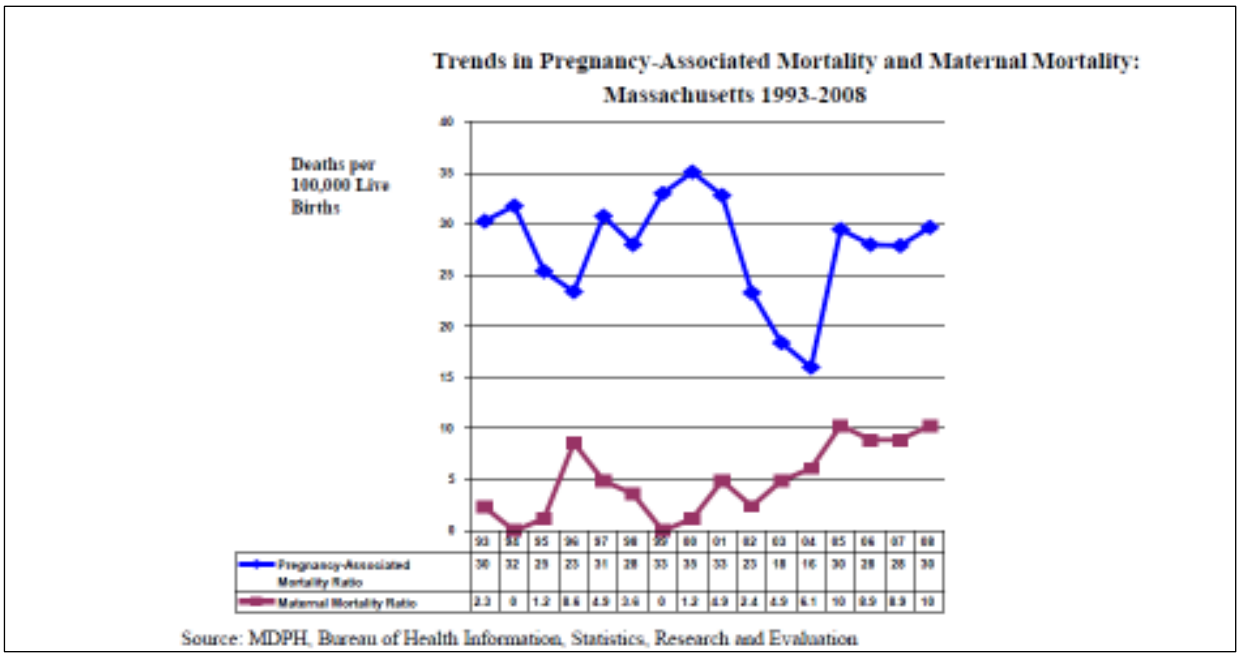


Figure F.2: Trends in pregnancy-associated mortality and maternal mortality: Massachusetts 1993-2008

Inter-Pregnancy Intervals (IPI)

Inter-Pregnancy Interval (IPI) is defined as the interval in months between a birth or fetal death and the beginning of a next pregnancy. A short IPI is any interval equal to or less than 12 months. Short IPIs, particularly those less than 6 months, are associated with poor perinatal outcomes, including a significantly increased risk of preterm delivery and LBW, [30,31] maternal death, third trimester bleeding, premature rupture of membranes, puerperal endometriosis and anemia,[32] and uterine scar failure.[33] Short IPI can be associated with unplanned pregnancy or inadequate use of family planning services after the end of pregnancy.

IPI data are available from both the annual birth certificate (retrospectively) and longitudinally linked birth data in the Massachusetts Pregnancy to Early Life Longitudinal (PELL) data System (prospectively and retrospectively).[34] Figure F.3 below presents the prevalence of LBW and pre-term delivery by IPI in 2008. As the figure illustrates, very short (< 6 month) and longer (> 42 months) IPIs were associated with increased prevalence of poor birth outcomes in 2008. The prevalence of short (< 12 months) IPI by maternal age was as follows:

- 49.4% among women aged < 20 years
- 17.4% among women aged 20-34 years
- 11.3% among women aged 35 years or older

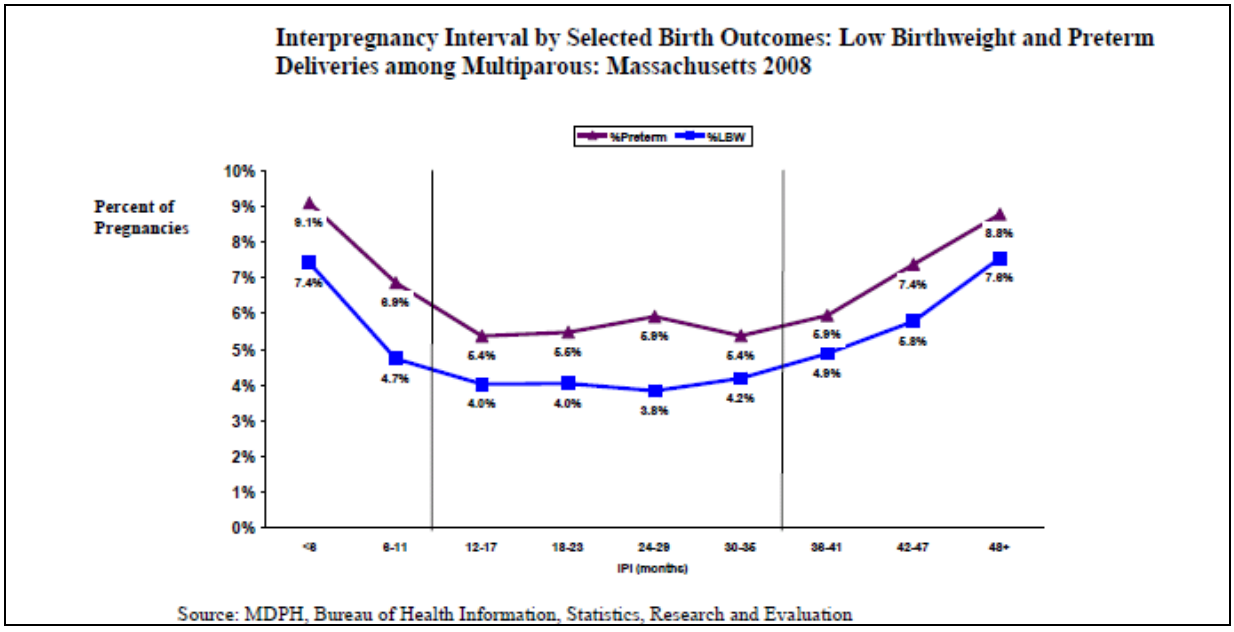


Figure F.3: Interpregnancy interval by selected birth outcomes: low birthweight and preterm deliveries among multiparous: Massachusetts 2008

Maternal and Family Mental Health

Recent research demonstrates a notable association between perinatal maternal mental health and infant birth outcomes.[35] In a recent study, the offspring of mothers with any mental health diagnosis during pregnancy or at the time of delivery illustrated increased risk of LBW, preterm birth, placental abruption, tocolysis, respiratory distress syndrome, and in cases where diagnosis was made at delivery, fetal death.[36]

Maternal Depression

Postpartum depression has been shown to negatively affect maternal and infant health, including interfering with infant development and the development of the mother-child bond.[37] Given the short and long-term sequelae for mothers and their infants associated with maternal perinatal and postpartum depressive symptoms, the importance of addressing maternal mental health issues is apparent.

According to the 2007/2008 MA PRAMS survey:[38]

- About 8% of mothers reported always or often experiencing depressive symptoms during the post-partum period, whereas 24.3% reported sometimes having these emotions and 67.8% reported rarely or never experiencing depressive symptoms following the birth of their child
- The prevalence of often or always experiencing post-partum depressive symptoms was significantly higher among Hispanic (12.1%) mothers compared to White, non-Hispanic (6.4%) mothers
- About 16.6% of mothers aged < 20 years reported often or always experiencing depressive symptoms post-partum, significantly higher than among mothers aged 30-39 years (6.4%) or 40 years and older (1.1%).
- The prevalence of post-partum depressive symptoms was more than twice as high among mothers living at or below 100% FPL (15.2%) compared to those living above 100% FPL (5.9%), and was also higher among mothers with less than high school (10.7%), high school (10.6%), and some college (9.4%) education compared to those women who were college graduates (4.8%)
- Among women who indicated that they often or always experienced depressive symptoms during the postpartum period, only 33.6% sought help for these depressive emotions

Data from the 2008 BRFSS indicate the following regarding self-rated mental health among Massachusetts women aged 25-49 years of age:[39]

- The prevalence of always or usually receiving the emotional support one needs ranged from 84% to 86% across age groups and was highest among those aged 45 to 49 years
- The prevalence of 15 or more tense days in the past month was highest (19.2%) among women aged 30-34 and 45-49 years, and lowest (15%) among women aged 25-29 years

Recent research using linked hospital visit data in the PELL data system indicates that during 2001-2005, the most prevalent maternal mental health diagnoses documented at hospital admissions during pregnancy and 12 months post-partum were mood disorders (3.4%), including depressive and bipolar disorder. In particular, depressive disorder made up 2.8% of all mental health diagnoses at admission during this period. Approximately 25% of mental health diagnoses were documented during the pregnancy, over 40% were documented at the time of delivery, and 33% were documented during the post-partum period.[40]

In April 2010, MDPH conducted three focus groups with new mothers in Needham, Fall River and Somerville/Cambridge. Maternal mental health emerged as a prevalent concern. Women stated that the transition from pregnancy to motherhood was a difficult period and they often felt unprepared, isolated, alone, and/or depressed. During the postpartum period, women acknowledged that they often felt guilty taking time for themselves and that it was difficult to accomplish everyday activities. Some women also noted that their male partners were unaware or not familiar with the “baby blues” or postpartum depression and were unsure of how to help their partners.

In an earlier focus group conducted in Fall 2009 with mothers from the Cambridge/Somerville and Fall River Early Intervention Partnership Programs (EIPP), participants expressed a desire to know that other mothers had gone through similar emotional experiences and to find ways in which to connect with these mothers. Connecting with other mothers was of importance particularly for women who lacked social or familial support networks. Participants also expressed a desire to feel more in control of their own physical and emotional well-being, welcomed advice about self-care, wanted to know the reasons why babies cry and also safe ways to calm crying babies.

Mental Health Visits to Emergency Rooms (ER) within Massachusetts Communities
While focus group and MA PRAMS data give an overview of maternal depression statewide, there is little community-level data on mental health. However, data from the Massachusetts Division of Health Care Finance and Policy include codes for emergency room (ER) visits.[41] A mental health ER visit is one for which the main cause for the visit is a mental health issue. A mental health-related visit is one for which mental health is a symptom or condition that exacerbated another condition for which a person sought ER care.

- During 2005–2007, 17.1% of all ER visits for women aged 15-44 years were for mental health or mental health related conditions
- During 2005–2007, 20.2% of all ER visits for men aged 15-44 years were for mental health or mental health related conditions
- Massachusetts communities with the highest rates of mental health or mental health related ER visits for women aged 15-44 years included Fall River (32.4%), Southbridge (31.4%), Fitchburg (25.3%) and New Bedford (25.1%)
- Massachusetts communities with the highest rates of mental health or mental health related ER visits for men aged 15–44 years included Southbridge (31.7%), New Bedford (31.2%), Fall River (25.6%), Leominster (25.3%), Provincetown (25.1%), Chicopee (24.7%), Quincy (24.6%), and Lynn (23.9%).

Child Health and Development

Asthma

Asthma Prevalence
Asthma is one of the more prevalent health conditions among children. Proper management, including personalized medical care that educates the child, parents, teachers, and extended family about symptoms, the use of medications, and the avoidance of environmental triggers, can significantly reduce asthma hospitalizations and deaths and dramatically improve the child's quality of life.

According to a three-year average annual estimate from 2005-2007 BRFSS data, which asks respondents about current asthma among children in their household, 10.3% of children aged < 18 years had asthma, representing an increase in prevalence from previous years.[42]

Massachusetts also has a unique data source that tracks asthma prevalence by individual schools called the Pediatric Asthma Surveillance Project. A 2009 report, Pediatric Asthma in Massachusetts 2006 – 2007, examined asthma data from a total of 2,075 public, private, and charter schools (approximately 97.1% of the schools serving grades K-8 in the Commonwealth during the 2006-2007 school year) and reported that the prevalence of asthma was 10.8%, up from 9.2% in 2002-2003.[43] In addition, reported asthma prevalence for all children by grade level showed that prevalence generally increased by grade through grade 5 (Kindergarten 9.4% to 5th grade 11.4%). After grade 5, prevalence leveled off at approximately 11%, as Figure F.4 below illustrates:

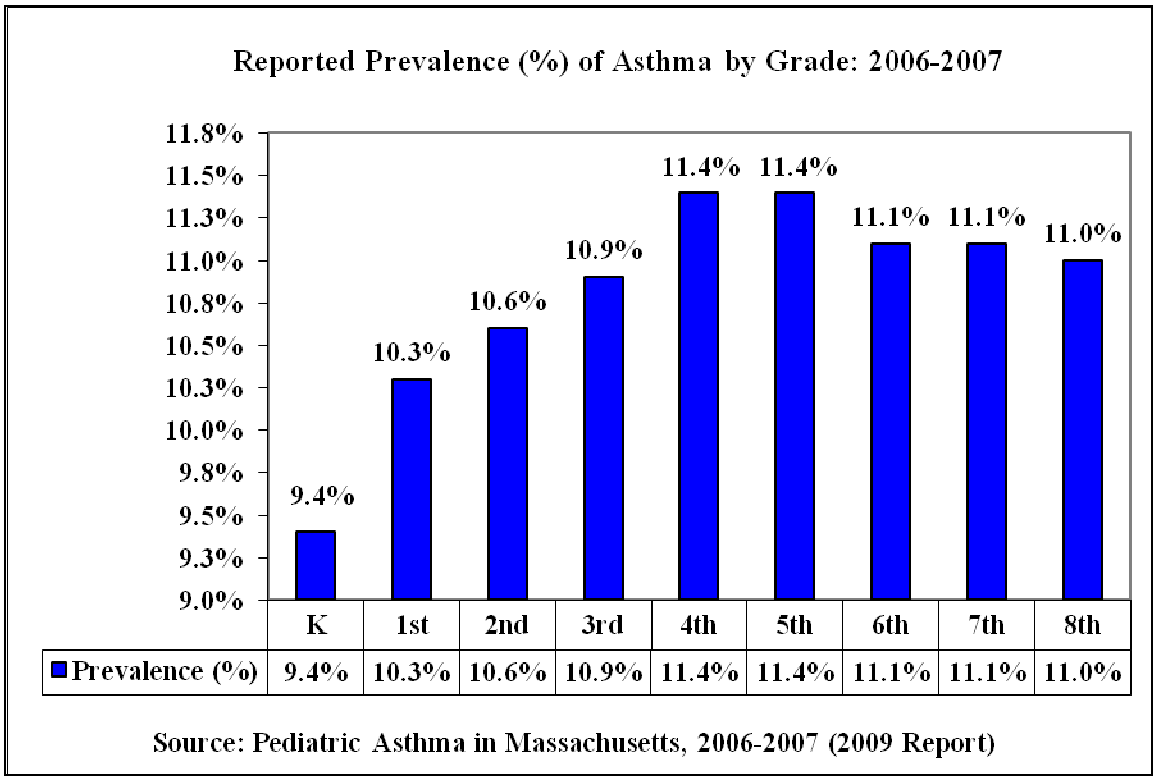


Figure F.4: Reported prevalence (%) of asthma by grade: 2006-2007

Asthma prevalence was also observed to vary by gender, as 11.3% of males and 9.4% of females, respectively, had current asthma from 2005-2007.[44]

Asthma is the most prevalent chronic disease reported by youth on the 2009 Massachusetts Youth Health Survey (MYHS). Eighteen percent (18%) of middle school students and 23% of high school students reported ever having been told by a health care provider that they have asthma (compared with 21% and 23% in 2007, respectively). These data were self-reported, and suggest high prevalence among teens, but are not unlike findings from other states. According to data from the Strategic Plan for Asthma in Massachusetts 2009-2014, the prevalence of current asthma in Massachusetts was higher among children that were:[45]

- Aged 12 – 17 years
- Male

- Living in households with lower incomes
- Living in households with lower educational attainment by the adult
- Had a disability

This suggests that there are economic and social factors related to asthma incidence which may in part be due to the built environment - including older houses and access to recreational activities - experienced by low income, Black, and Hispanic populations in the state.

Finally, and perhaps most importantly, the level of asthma control among Massachusetts children with current asthma during the years of 2006-2007 was in need of substantial improvement. The results suggest that improvements in asthma education and management for children and families are needed, given that:[46]

- 65.2% of children's asthma was not well controlled or very poorly controlled
- 34.8% of children's asthma was well controlled

Asthma Hospitalizations & Emergency Visits
In 2005, there were 9,121 hospitalizations, 2,101 observation stays, and 36,146 emergency department visits due to asthma in Massachusetts across all age groups.[47] From 2002 to 2005, there were an average 102 episodes of care due to asthma at an emergency department every day.

Disparities exist in asthma hospitalizations, emergency department visits, and outpatient observation stays by age, gender, race/ethnicity, geography, and season. From 2000 through 2006, Black, non-Hispanics and Hispanics consistently had substantially higher age-adjusted rates of hospitalization due to asthma than White, non-Hispanics. Furthermore, the rates of hospitalization in 2000-2006 due to asthma were higher among males than females in the 0-4 and 5-11 year age subgroups.

The three-year average rates of hospitalization due to asthma were not evenly distributed geographically among the state. Although there is not city/town specific data regarding rates of hospitalization due to asthma in Massachusetts, there are areas in the state where rates are higher than the statewide rate (14.1 per 10,000 residents); these include areas surrounding Fall River (Southeast), Boston, New Bedford (Southeast), Brockton (Southeast), Worcester (Central), and Springfield (Hampden County).

Finally, from 2002-2005, children aged 0-4 years had the highest rates of emergency department visits, outpatient observation stays, and hospitalizations due to asthma of any group. However, they had an average hospitalization length of stay of 2.0 days, which was lower than any other age group.

Lead Poisoning

Children between the ages of 9 months and 6 years remain most at risk for lead poisoning in Massachusetts. Young children absorb lead more easily than adults and the harm done by lead can affect children' growth, development, behavior and health. Even low levels of lead in a child's blood may have long-term effects on learning and behavior.[48]

Most of the lead poisoning in Massachusetts comes from lead paint dust in older homes. Children are poisoned more often by ingesting dust from lead paint than by eating chips or chewing on painted surfaces.[49] According to CDC's State Surveillance Data,[50] from 1997-2006 there was a clear decrease in the prevalence of both lead poisoning (blood lead levels [BLL] of 25 mcg/dL or above) and elevated lead levels (EBLL of 20-24 mcg/dL) among Massachusetts children aged 6 months to 6 years:

- The combined statewide incidence of blood lead levels greater than or equal to 20 mcg/dL was 2 per 1,000 screened in 1999 (from 3.2 per 1,000 in 1997) and only 1 per 1,000 screened in 2006 as Figure F.5 illustrates below:[51]

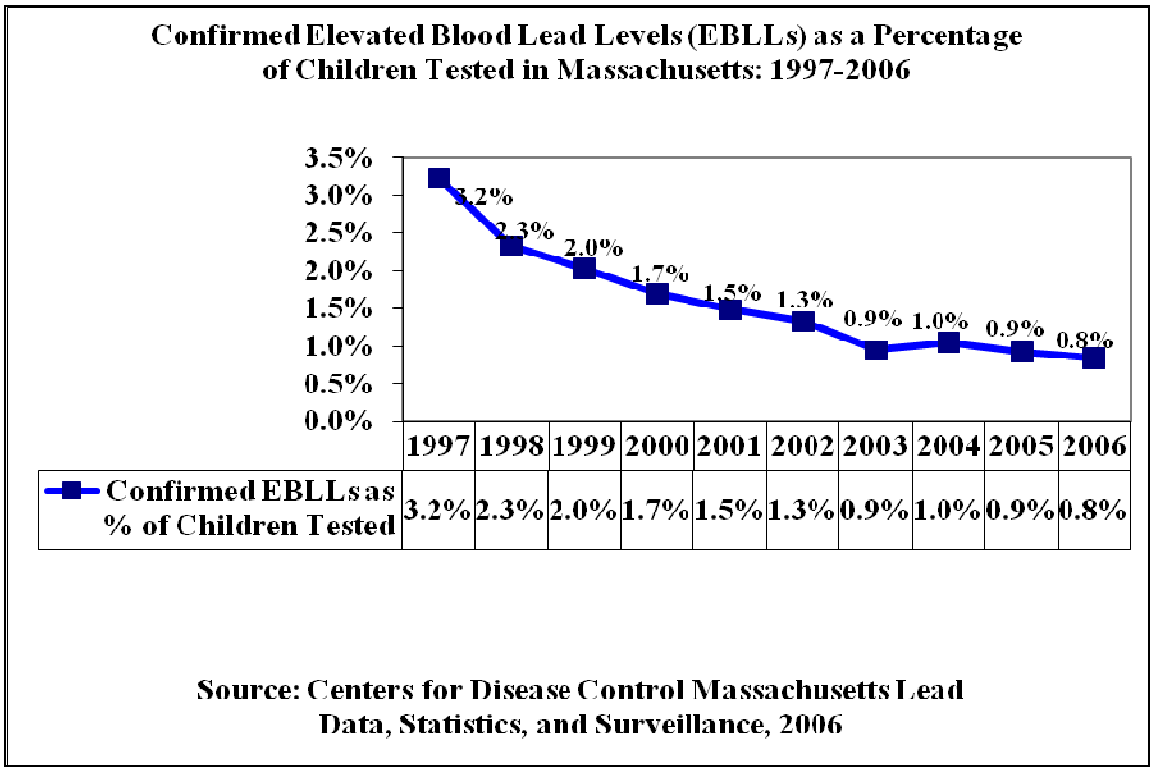


Figure F.5: Confirmed elevated blood lead levels (EBLLs) as a percentage of children tested in Massachusetts: 1997-2006

- The 5-year average rate of confirmed EBLLs as a percentage of children tested for the period of 2002-2006 was 1.01[52]
- A disproportionate share of all cases of lead poisoning and elevated lead levels continues to occur in certain cities, such as Chelsea (North Shore), Lynn (Northeast), New Bedford (Southeast), and Springfield (Hampden County)[53]

Childhood Obesity

Nationally, and in Massachusetts, attention is focused on obesity and risk factors associated with being overweight. Many adverse health outcomes are associated with obesity such as diabetes, heart disease and many other chronic diseases.

- According to the 2009 PedNSS, of children aged < 5 years, 14.7% were obese, compared to 14.1% nationally (for 2008)[54]
- During 2008- 2009, 13.9% of preschool children enrolled in Massachusetts Head Start programs received treatment as a result of being overweight[55]
- Of the 109,672 public school students in grades 1, 4, 7, and 10 who were screened in 2008-2009, 16.9% were overweight and 17.3% were obese.

Children's Medical Security Plan (CMSP)

The Children's Medical Security Plan (CMSP) is a program of MassHealth, the state's Medicaid program. The CMSP program provides primary and preventative care for children and adolescents who do not have health care coverage including the following services:

- Pediatric care (well child visits and immunizations)
- Office visits (sick visits and follow-up care)
- Diagnostic laboratory and x-rays
- Outpatient mental health services and substance abuse treatment services
- Outpatient surgery and anesthesia that is medically necessary for the treatment of inguinal hernias and ear tubes
- Prescription drugs
- Eye exams and hearing tests
- Durable medical equipment
- Dental services

To be eligible for CMSP, an applicant must be a child under the age of 19, be a Massachusetts resident, have no other health insurance coverage, and not be eligible to enroll in any Massachusetts coverage types, except MassHealth Limited which covers emergency services. Some children enrolled in CMSP are also eligible for MassHealth Limited. There is no income limit for CMSP. However, families with incomes over 200% of the federal poverty level (FPL) may have to pay a premium. Children with family incomes up to 400% of the FPL are eligible for the Health Safety Net which covers some other medically necessary services at Massachusetts acute hospitals and community health centers for services not covered by the CMSP. A deductible based on family size and income may apply.

As of June 30, 2010, there are 16,283 children receiving services through CMSP, with 434 children in Boston, 314 in Lynn (Northeast), 259 in Chelsea (Northshore), and 200 in Framingham (Central MA). Worcester (Central MA), Everett (North Shore), Cape and the Islands (Southeast), Somerville (North Shore), Waltham (within 10 miles of Boston), Brockton (Southeast), New Bedford (Southeast), Malden (North Shore), Lawrence (Northeast) and Revere (North Shore) also have high numbers (more than 100) of children on CMSP.[56] This mirrors communities with high numbers of undocumented persons (See Vulnerable Populations Domain for a further discussion of this population).

Infant and Early Childhood Mental Health

The Zero to Three infant mental health task force defines infant mental health (IMH) as the developing capacity of the child from birth to three to 1) experience, regulate, and express emotions; 2) form close interpersonal relationships; and 3) explore the environment and learn - all in the context of family, community, and cultural expectations for young children. Infant and early childhood mental health is synonymous with healthy social and emotional development.[57]

Multiple factors can influence infant and early childhood mental health, including maternal depression, maternal or family drug and alcohol use, including in utero exposure to drugs, alcohol and other adverse childhood experiences. Both prenatal and postpartum exposure to drugs and alcohol can compromise cognitive development, learning, behavior and psychopathology of the child.

Increasing evidence of long-term sequelae for infants experiencing adverse experiences is emerging from neuroscience and retrospective studies with adults. The social and emotional health of young children profoundly affects their general development and ability to learn. Stressors in their environments and difficulties in relationships with caregivers can increase the risk of developmental problems and lead to maladaptive differences in brain structure and function.[58] Infants and young children are especially vulnerable to "toxic stress," that is, extreme stress absent the buffering effects of consistent caregiver relationships. Toxic stress in early childhood can lead to long-term negative effects on cognition, behavior, and health and mental health.[59]

The community of Boston recently developed and implemented a comprehensive, 10 year school readiness roadmap entitled *Thrive in Five – Boston's Promise to its Children* with particular focus on the emotional health and well being of its youngest children and the reduction of environmental conditions that can create toxic stress. A *Thrive in Five* research review estimated the incidence of children experiencing high levels of toxic risk factors in four key areas: prenatal exposure to drugs or alcohol; a caregiver with postpartum depression or mental health disorder; an open child protective case; or exposure/witness to domestic violence.[60] Using conservative assumptions, 26% of Massachusetts children under the age of five years were estimated to experience one or more risk factors and roughly 1 in 6 children (16%) experienced at least two of the four risks. In addition, more than 100,000 children from birth through age 18 in Massachusetts do not receive the mental health care they need.

A recent study conducted by the Urban Institute assessed the characteristics and access to services for women who are depressed with infants living in poverty and they found that:[61]

- Eleven percent (11%) of infants living in poverty have a mother suffering from severe depression
- Compared with their peers with nondepressed mothers, infants living in poverty with severely depressed mothers are more likely to have mothers who also

struggle with domestic violence and substance abuse, and who report being only in fair health

- Many severely depressed mothers do not receive care even though depression is highly treatable

In addition, Fellitti et al. studied the correlation between adverse childhood experiences (ACE) as self-reported by adults with their adult health. They found high correlations between the number of ACE and harmful health conditions or behaviors, including alcohol and drug abuse, depression, smoking, poor health, and severe obesity.[62]

Healthy child development relies on responsive caregiving, characterized by emotional availability and responsiveness.[63,64] Maternal depression seriously undermines these crucial aspects of parenting. An impressive knowledge base clearly delineates the link between maternal depression and a host of poor child health and developmental outcomes, including cognitive and language delays,[65,66] difficulties in emotional regulation and attachment, [67,68,69] psychopathology,[70] early onset of depression,[71] and behavioral and educational problems.[72] Older children are more likely to need special education, be held back in school, or drop out of school.[73]

The mental health (MH) needs of infants, toddlers and preschoolers, however, are only beginning to be addressed. This is due both to insufficient recognition that there is such a thing as infant MH,[74] and also to the fact that many MH problems in early childhood do not become pressing until the child faces difficulties in school. But the case for early intervention to address social and emotional problems in early childhood is compelling. Prompt intervention to address social and emotional problems in the context of the child's key relationships and environments has been shown effective in reducing behavior problems and referrals for special education (SPED).[75] Furthermore, during 2008-2009, 18.4% of children enrolled in Massachusetts Head Start/Early Head Start programs received consultation from a mental health professional.[76]

Efforts to develop a systemic infant and early childhood MH (IECMH) approach in Massachusetts have been challenged by many of the barriers noted nationally.[77] These include administrative fragmentation, inconsistent or conflicting eligibility, repetitive reporting requirements, lack of easy access to specialized services, and poor use of scarce professional development resources.

These barriers are exacerbated by the fact that Massachusetts lacks a workforce that is sufficiently trained in IECMH in any service sector, including primary care, behavioral health (BH), IDEA Part C Early Intervention (EI), Part B SPED, and child care. Among the 2,200 early education and care (EEC) centers and 11,000 Family Child Care homes statewide, mental health consultants are embedded in only 16 of the large EEC centers. Finally, only one in five consultants in these centers have expertise in infant mental health, and even fewer speak a language other than English.[78]

Children's Behavioral Health Initiative (CBHI)

The Children's Behavioral Health Initiative (CBHI) is an interagency initiative of the Commonwealth's Executive Office of Health and Human Services (EOHHS). Its mission is to strengthen, expand and integrate Massachusetts state services into a comprehensive, community-based system of care to ensure that families and their children with significant behavioral, emotional and mental health needs obtain the services necessary for success in home, school and community.

CBHI was created by Dr. JudyAnn Bigby, Secretary of EOHHS, to implement the remedy in Rosie D v Patrick, a class action law suit filed on behalf of MassHealth-enrolled children under age of 21 with serious emotional disturbance (SED). The judgment in the case requires MassHealth to[79]:

1. As of December 31, 2007, require primary care providers to offer standardized behavioral health screenings at well child visits for all youth under the age of 21 enrolled in MassHealth Standard or CommonHealth.

2. As of November 30, 2008, require mental health clinicians at most levels of care treating youth under the age of 21 enrolled in MassHealth Standard or CommonHealth to use the Child and Adolescent Needs and Strengths (CANS) tool as part of the clinical assessment process.

3. During the period of June 30, 2009 through November 1, 2009, implement five new home- and community-based services for youth with behavioral health needs under the age of 21 enrolled in MassHealth Standard or CommonHealth. These services include: Intensive Care Coordination, a targeted case management service delivered according to the Wraparound model as defined by the National Wraparound Initiative; In-Home Therapy; In-Home Behavioral Services; Therapeutic Mentoring; Family Support and Training; and Mobile Crisis Intervention.

4. As of December 31, 2007, inform MassHealth members, MassHealth providers, staff of child-serving state agencies and schools, people who come into contact with MassHealth members, and members of the general public, about these new services and how to access them.

MassHealth has successfully met each of the Court's deadlines.

The most recent screening data is from the first quarter of calendar year (CY) 2010, January 1 through March 31. Data is available for all providers serving MassHealth members under age 21: those under contract with one of MassHealth's health plans, those who participate in the Primary Care Clinician (PCC) Plan and those who bill MassHealth on a Fee For Service (FFS) basis. Screening rates vary by age:

Mental Health Screening Rates Using CANS tool:

Age Group	Oct. 1- Dec. 31, 2009	Jan. 1 – Mar. 31, 2010
< 6 months	33.5%	35.4%
6 months through 2 years	62.8%	65.1%
3 through 6 years	67.8%	70.2%
7 through 12 years	70.1%	73.1%
13 through 17 years	64.1%	66.7%
18 through 20 years	28.8%	28.1%

The rates of screening correlate with anecdotal reports from Primary Care Clinicians that they are not satisfied with the current instruments available for screening children under six months of age. Primary care clinicians who serve on MassHealth advisory committees speculate that clinicians serving members 18 and over may not be thinking of these members as subject to the EPSDT periodicity schedule for screening. MassHealth is in the process of developing quality improvement activities to address variations in screening rates.

The number of youth who have received each of the new home- and community-based services during the period of June 30, 2009 through March 31, 2010 are:[80]

Intensive Care Coordination	5,721
Family Support and Training	4,613
In-Home Therapy	6,120
Therapeutic Mentoring	2,125
In-Home Behavioral Services	165
Mobile Crisis Intervention	8,241

**Note: the numbers of youth receiving each of the services are unduplicated within the service, there is likely duplication across all of the services as some youth receive more than one service.*

Despite increasing Medicaid resources for children and youth with behavioral health needs, relatively few BH clinicians have been trained to assess and treat behavioral conditions in children younger than five.

Child School Readiness

Poor Performing Schools

The Massachusetts Department of Elementary and Secondary Education (DESE) had 392 operating school districts for the 2009-2010 year, with 1,831 public schools (1,146 elementary schools, 314 middle/junior high schools, and 271 high schools). DESE provides a framework for school and district accountability and assistance, with the goal of improving student achievement.

This system evaluates school districts through the use of Mathematics and English Language Arts Massachusetts Comprehensive Assessment System (MCAS) testing results by creating a composite performance index which also takes into account the percentage of students earning failing/warning scores over four years, annual student growth percentile for the years available, and improvement as measured by the change in composite performance index over four years.[81] A school given a "Level 4" status is in the lowest 20% in the state in performance and has not shown signs of substantial improvement in the previous four years. The following cities/towns are reported by DESE to have "Level 4" schools:[82]

1. Boston
2. Fall River
3. Gill
4. Holyoke
5. Lawrence
6. Lowell
7. Lynn
8. Montague
9. New Bedford
10. Randolph
11. Southbridge
12. Springfield
13. Worcester

Truancy

Another way to measure educational outcomes to determine levels of need for home visiting services is through student truancy. Truancy is predictive of maladjustment, poor academic performance, dropping out of school, substance abuse, delinquency, and teenage pregnancy.[83] Additionally, truancy is predictive of adverse outcomes in adulthood, including violence, marital instability, job instability, criminality, and incarceration.[84] Nationwide, 10.5% of 8th graders and 16.4% of 10th graders had skipped school in the past four weeks.[85]

The proportion of Massachusetts students who were truant during 2008-2009 (defined as the number of students who were truant for more than 9 days divided by the end of year enrollment) was 0.6%. DESE tracks unexcused absences among students, yet each local school district has its own definition of what constitutes an unexcused absence. The cities with the highest truancy percentages in the Commonwealth were:[86]

1. Edgartown (Cape & Islands): 31.1%

2. Worcester (Central): 30.3%
3. Springfield (Hampden County): 28%
4. Salem (Northshore): 26.7%
5. Arlington (Boston Metro): 17.1%

Subsidized Childcare

The Massachusetts Department of Early Education and Care (EEC) administers financial assistance to approximately 60,000 children from low income families, aged birth to 13 years, and licenses nearly 12,000 early education and care and out-of-school-time programs statewide. Almost all child care provided outside of a child's own home must be licensed by EEC to comply with standards of health, safety, and staffing. The three main types of child care programs authorized by EEC are:

- Group/Center-Based Programs
  - Serve children full-time or part-time in groups or classrooms of children
- School Age/After School Programs
  - Serve children aged 5-14 years generally before and/or after schools and/or during school vacations
- Family Child Care Programs
  - Care is delivered in a provider's home and may serve a maximum of 6 or 10 children (with an additional assistant)

Examination of the EEC child care program waiting lists provided insight into unmet need throughout the cities and towns of the Commonwealth. The overall percent of children aged 0 to less than 12 years waitlisted for an EEC subsidized child care spot in Massachusetts during April 2010 was 1.4%.[87] The highest unmet need for childcare programs in Massachusetts were in the following cities and towns:

1. Framingham (Boston Metro)
2. Lawrence (Northeast)
3. Lowell (Northeast)
4. Quincy (Boston Metro)
5. Revere (Northshore)

Early Intervention (EI) Enrollment

The special health care needs of children and youth in Massachusetts cover a broad spectrum of physical, mental, and functional disorders. The state broadly defines special health care needs and due to the lack of a single definition, draws upon multiple sources to identify the special health needs of the population, including EI enrollment, school-based special education statistics, the National Survey of Children with Special Health Care Needs (NS-CSHCN), the National Survey of Children's Health (NSCH), and other surveys.

Early Intervention (EI) program eligibility gives an indication of the type of special needs for children aged less than 3 years. EI served 14.0% (33,126) of children aged < 3 years residing in Massachusetts in FY 2009, and the EI population continues to grow. During FY 2008, there were a total of 15,140 (up from 13,862 in FY 2004) children newly enrolled in EI (See chart below).[88]

New EI Enrollments and Reasons for Enrollment, FY07-FY08

Developmental Delay	FY04		FY05		FY06		FY07		FY08	
	#	%	#	%	#	%	#	%	#	%
Adaptive/Self-Help	3,105	22%	2,815	21%	2,909	21%	3,036	20%	3,057	20%
Cognitive	3,216	23%	3,215	24%	3,529	25%	3,746	25%	4,046	27%
Language	8,372	60%	9,149	67%	9,822	70%	10,336	70%	10,915	72%
Motor	4,307	31%	4,283	31%	4,824	34%	5,100	34%	5,526	36%
Social/Emotional	1,704	12%	1,642	12%	1,745	12%	1,808	12%	1,883	12%
Total eligible due to delay *(unduplicated)*	10,585		11,127		12,105		12,880		13,334	
Total new admissions *(unduplicated)*	13,862		13,604		14,070		14,823		15,140	

The biggest reason for eligibility was language delay, with the other major categories as follows (Note: These are not mutually exclusive, as a child could have more than one delay):

- 72% had a language delay (up from 60% in FY 2004)
- 36% had a motor delay (up from 31% in FY 2004)
- 27% had a cognitive delay (up from 23% in FY 2004)
- 20% had an adaptive/self-help delay (down from 22% in FY 2004)
- 12% had a social/emotional delay (the same as in FY 2004)

Special Education

According to data from the Department of Elementary and Secondary Education (DESE), students with disabilities receiving special education services comprised 17.0% (n=162,699) of the Massachusetts public school student population during the 2009-2010 school year, up from 15.6% (n=154,391) during the 2003-2004 school year.[89] The trend over the past few years shows a steady increase in the overall percentage of students with disabilities in Massachusetts. It is notable that while total enrollment of the Commonwealth's students has declined, from 991,478 in 2003-2004 to 957,053 in 2009-2010, enrollment of students with disabilities has increased.

According to DESE, students receiving special education services during the 2008-2009 school year were classified into the following disability categories:[90]

- 35.8% Specific Learning Disabilities (compared to 45.9% in 2003-2004)

- 17.3% Communication (compared to 13.6% in 2003-2004)
- 10.1% Developmental Delay (compared to 9% in 2003-2004)
- 8.4% Emotional (compared to 8.6% in 2003-2004)
- 6.9% Health (compared to 3.5% in 2003-2004)
- 6.6% Intellectual (compared to 8.1% in 2003-2004)
- 5.9% Autism (compared to 3.2% in 2003-2004)
- 3.9% Neurological (compared to 2.8% in 2003-2004)
- 2.9% Multiple Disabilities (compared to 3.4% in 2003-2004)
- 1.0% Physical (compared to 0.8% in 2003-2004)
- 0.7% Sensory/Hard-of-Hearing (same in 2003-2004)
- 0.3% Sensory/Vision Impairment (same in 2003-2004)
- 0.1% Sensory/Deaf-Blindness (compared to 0.2% in 2003-2004)

Child Maltreatment and Unintentional Injuries

Unintentional Injuries

Unintentional injuries are the leading cause of deaths in children aged 1-18 years of age.[91] About one in four children receive medical attention in the US for an injury and it is estimated that at least 90% of these injuries are preventable.[92] Nationally, unintentional falls are the leading cause of nonfatal unintentional injury in the United States among children 0-9 years, followed by unintentional struck by/against, and unintentional other bite/sting.[93]

Data on nonfatal injuries among Massachusetts children aged 0-9 years were examined to better understand areas of injury prevention. Inpatient hospitalizations, observation stays and emergency department discharges associated with unintentional injury of children aged 0-9 years were analyzed from the most recently available data, FY2008.[94] The overall Massachusetts state rate for unintentional injury hospitalizations in FY2008 was 10,132/100,000. The five communities in the Commonwealth with the highest rates of unintentional child injury were:

1. Tisbury (Cape & Islands): 32,748/100,000
2. Nantucket (Cape & Islands): 24,932/100,000
3. Ware (Central): 22,961/100,000
4. North Adams (Berkshires): 21,413/100,000
5. Orange (Central): 20,350/100,000

Infant Deaths due to SIDS and Unintentional Injuries

In 2008, there were 370 deaths to Massachusetts infants less than 1 year of age for which the death certificate was linked with the infant's birth certificate.[95] Among those deaths, 285 were neonatal deaths (aged <28 days) and 85 were post-neonatal deaths (aged 28 - 364 days). Unfortunately, it is not possible to identify infant deaths due to neglect from the linked birth-death file. To ascertain deaths that were potentially preventable, deaths classified as resulting from SIDS or unintentional injuries were examined. A total of 4 (1.4%) of the neonatal deaths were classified as SIDS deaths. Among post-neonatal

deaths, 18 (21.2%) were classified as SIDS and 4 (4.7%) were classified as unintentional injuries.

According to the Massachusetts Department of Children & Families (DCF),[96] the state child welfare agency, 34 children in families with an open DCF case status died in 2007. Eleven (11) of these children died from natural causes, 7 died in accidents, and 11 were homicide victims. For the remaining 5 children, a manner of death was undetermined following an autopsy by a medical examiner. Fifty percent (50%) of the deceased children were infants (less than one year old), 12% were 1-4 years old, 15% were 5-11 years old, and 24% were adolescents (12-17 years old). The deaths of an additional six children were maltreatment-related; five of the children were from families not previously known to DCF, and one child was from a family whose case had been closed for more than six months at the time of the child's death.

Specifically, Boston was the family residence of 7 DCF involved children who died in 2007. Springfield was the only other city with more than two child fatalities (5 children).[97] Comparing the DCF regional distributions of deceased children to all children in the caseload showed that the Boston Region was the most over-represented, and that the Northeastern, Western, and Central Regions were marginally under-represented.

Parenting Stressors

Single-Parent Households

Exposure to single parent households in childhood has associations with anxiety disorder, educational outcomes (less encouragement and help with work, lower test scores, and lower grades), welfare dependence and personal income, and criminal behavior.[98,99,100] Yet many findings in the literature are by confounding social and contextual factors associated with the exposure of single parenthood.[101]

In an effort to understand the needs of cities and towns throughout the Commonwealth, Massachusetts investigated the prevalence of children aged 0-11 years living in either single female and male headed households. The following cities and towns all had > 40% of households headed by a single parent:[102]

- Monroe (Central MA)
- Springfield (Hampden County)
- Holyoke (Hampden County)
- Lawrence (Northeast)
- New Bedford (Southeast)
- Fall River (Southeast)
- Boston

Parents with Low Education

Educational attainment has significant health and well-being implications over the life course. Not only do adults with bachelor's degrees earn more than those with high school degrees,[103] they also have greater access to resources influencing health status, such as medical services.[104] This disparity in access affects morbidity and mortality, as those without a high school education have higher mortality than those with a degree.[105,106] The level of both parental education and income are shown to correlate with child educational attainment indirectly through parents' beliefs and stimulating home behaviors.[107]

To inform the needs of home visiting services in Massachusetts, cities and towns were ranked by the percentage of mothers with less than a high school education giving birth aggregated from 2004-2008. While the statewide average percentage was 10.6%, the communities with the highest proportions of mothers with low education were as follows:[108]

1. Chelsea (Northshore): 43.8%
2. Holyoke (Hampden County): 40.9%
3. Springfield (Hampden County): 30.7%
4. Lawrence (Northeast): 28.1%
5. Lynn (Northshore): 27.9%

Teen Parents

In 2008, there were 4,583 births among women aged 15-19 years, which was a decrease of 361 births from 2007.[109] The Massachusetts teen birth rate decreased from 22.0 births per 1,000 women aged 15-19 years in 2007 to 20.1 in 2008. In 2008, the Massachusetts teen birth rate was 53% below the 2007 U.S. teen birth rate of 42.5 births per 1,000 women aged 15-19 years.[110] The distribution of Massachusetts teen births in 2008 was as follows:[111]

- 30% of teen births were to women aged less than 18 years (1,401 births)
- 70% were to women aged 18-19 years (4,623)
- Compared with 2007, births to women aged 18 years and under decreased and births to women aged 19-20 years increased significantly in 2008
- The number of births to young teens (aged 10-14 years) was 40 in 2008 compared with 49 in 2007, but this was not a significant decrease
- Teen birth rates decreased for White non-Hispanic, Hispanic, and Asian women but not for Black non-Hispanic women
- Compared with 1998, 2008 rates for all race and ethnicity groups declined significantly: from 16.7 to 11.7 among White, non-Hispanics; from 71.5 to 32.4 among Black, non-Hispanics; from 121.6 to 66.7 among Hispanics; and from 26.5 to 13.0 among Asians
- Of the 4,619 teen (< 20 years of age) births occurring across the state in 2008, 2,035 (44.1%) were births to White, non-Hispanic mothers, 592 (12.8%) to Black, non-Hispanic mothers, 1,696 (36.7%) to Hispanic mothers, and 296 (6.4%) to mothers of Asian, American Indian, other or unknown race and ethnic descent

Some Massachusetts communities have teen birth rates that are consistently higher than the statewide rate of 20.1 per 1,000 teens aged 15-19 years (up to three to five times the

statewide rate). Communities with the highest teen birth rates in the state from 2004-2008 included:[112,113]

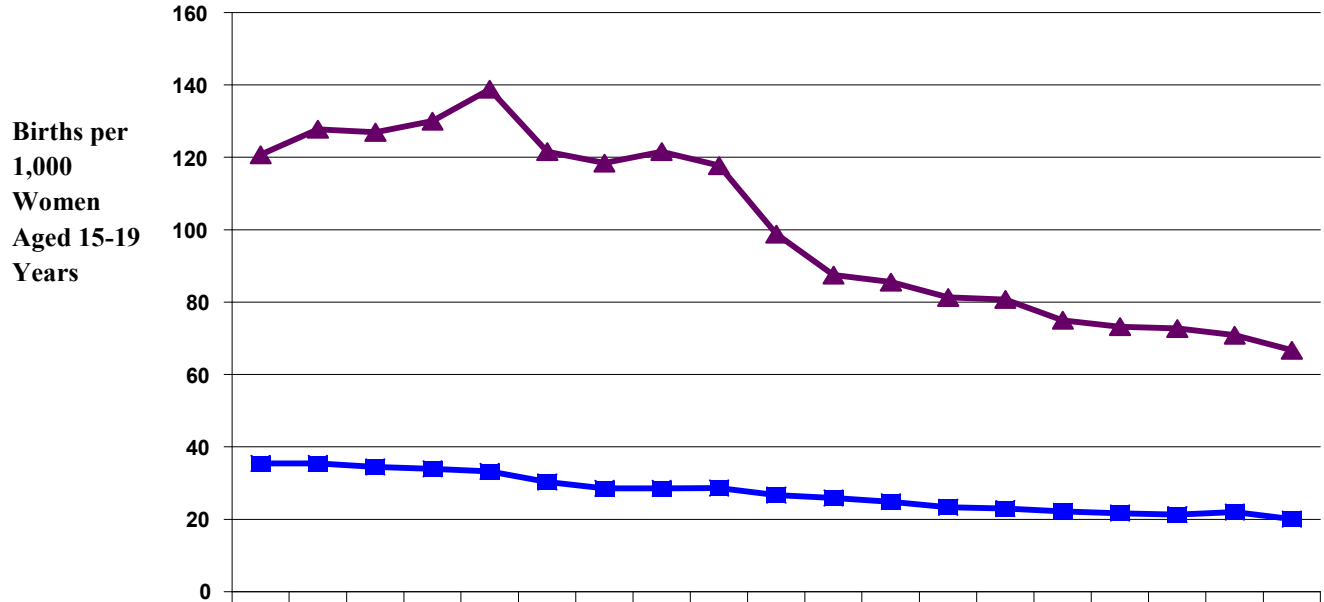
1. Holyoke (Hampden County): 115.3 per 1,000 teens aged 15-19 years
2. Chelsea (North Shore): 97.0 per 1,000 teens aged 15-19 years
3. Lawrence (Northeast): 80.9 per 1,000 teens aged 15-19 years
4. Springfield (Hampden County): 61.4 per 1,000 teens aged 15-19 years
5. Southbridge (Central): 60.9 per 1,000 teens aged 15-19 years

The birth rate for teens also varied by rural versus non-rural residence of the mother. Of the 4,583 teen births among women aged 15-19 years across the state in 2008, 4,021 (87.7%) occurred among non-rural communities, whereas only 509 (11.1%) occurred within rural communities.[114] In addition, the percentage of births to teens aged 15-19 years with at least one prior birth was 11.9% in 2008; this percentage was 6.2% among females aged 15-17 years and 14.2% among females aged 18-19 years. Furthermore, in 2008, there were 567 births to teen mothers aged less than 20 years with at least one prior birth, down from 584 in 2007. Of these:

- 280 (49.4%) had a short inter-pregnancy interval (less than 12 months)
- 264 (46.6%) had an inter-pregnancy interval between 12 and 35 months
- 23 (4.1%) had an inter-pregnancy interval equal to or greater than 36 months

There are significant racial and ethnic disparities in teen birth rates in Massachusetts. In 2008, teen birth rates decreased for Whites, Hispanics, and Asians but not for Blacks. Even though the rates for Whites and Hispanic declined, the gap in the teen birth rate between Hispanics and White, non-Hispanics increased with the Hispanic rate 5.7 times that of White, non-Hispanics (66.7 vs. 11.7 per 1,000 women ages 15-19 years). Teen birth rates have been consistently higher among Hispanics compared to the statewide rates since 1990 [See Figure F.6 below]:

Figure F.6: Teen Birth Rates among Hispanic vs. State Overall: 1990-2008



	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08
Massachusetts	35.4	35.4	34.5	34	33.2	30.3	28.5	28.5	28.6	26.7	25.9	24.9	23.3	23	22.2	21.7	21.3	22	20.1
MA Hispanic	120.8	127.8	126.9	130	138.8	121.6	118.4	121.6	117.7	98.79	87.48	85.52	81.31	80.7	74.99	73.18	72.68	70.87	66.7

Source: MDPH, Bureau of Health Information, Statistics, Research and Evaluation

Incarcerated Parents

With the establishment of the White House Office of Faith-Based and Neighborhood Partnerships in 2009 and the 2006 Promoting Responsible Fatherhood Initiative, there is a national focus on the intersection of fatherhood and the criminal justice system.[115,116] The need for this nationwide focus stems from the fact that in 2007, more than 1.7 million children had a parent in prison or jail and nearly 10 million children have a parent who is or has been under some form of criminal justice supervision.[117] The National Resource Center on Children and Families of the Incarcerated has reviewed the literature and documented the severe effects of parental incarceration on children, including:

- Feelings of shame, grief, guilt, abandonment, and anger
- Social stigma
- Disconnection from parent
- Poor school performance
- Impaired ability to cope with future stress and trauma

Massachusetts examined the incarcerated population by the last known residence to determine the distribution of parents represented in the incarcerated population. The top five cities/towns in the Commonwealth with the highest percentage of parents in the incarcerated populations were:[118]

1. Barre (Central): 85.7%

2. Ayer (Northeast): 83.3%
3. Marion (Southeast): 83.3%
4. Reading (Northeast): 83.3%
5. Scituate (Southeast): 83.3%

Family Economic Self-Sufficiency

Women Giving Birth Receiving Publically Financed Healthcare

Aggregating data from 2004-2008, Massachusetts identified communities with high percentages of women giving birth receiving publically financed health care. In the Commonwealth, the communities with the highest percentage of women giving birth receiving publically financed health care were:[119]

1. Holyoke (Hampden County): 74.5%
2. Chelsea (Northshore): 72.4%
3. Lawrence (Northeast): 71.7%
4. Springfield (Hampden County): 71.5%
5. Lynn (Northshore): 64.1%

Homelessness/Emergency Assistance

Homelessness is a major risk factor that can impede the healthy development of children and youth in multiple domains. Homeless children and youth move frequently, have inconsistent school attendance, and have disrupted ties to communities and extended families.[120] Massachusetts has experienced increases in homelessness with many factors contributing to this including: large changes in the real estate market leading to the conversion of rental units into condominiums, increasing rates of foreclosures, declining federal support for subsidized housing, inadequate increases in wages for working families, and the increasing prevalence of domestic violence and its negative effect on all aspects of physical and mental health.[121]

Emergency Assistance (EA) is the state's primary safety net program for families experiencing, and at imminent risk of experiencing homelessness. The EA program provides homelessness prevention resources so families can avoid having to enter shelter, critical emergency shelter to families who have nowhere else to go, rapid re-housing resources so families can exit shelter as quickly as possible, and stabilization resources so families can successfully maintain their new housing after exiting shelter.[122] As of July 2009, the EA program moved from the Massachusetts Department of Transitional Assistance (DTA) to the control of the Massachusetts Department of Housing and Community Development (DHCD), Division of Housing Stabilization.

Given the dramatic increases in the number of homeless families in Massachusetts, FY10 saw the highest caseload of families accessing EA services to date, with an estimated 3,507 homeless families across the Commonwealth while program eligibility requirements were decreased from 130% to 115% of the federal poverty guideline, equating to a maximum annual income of $25,368 for a family of four.[123] Placement of

families in emergency shelters and motels was afforded $91.6 million of the state budget for FY10. This number increased to $113.5 million in FY11 due to the rising caseload.

Between June 2008 and July 2010, a total of 75,335 families sought out information and/or EA benefits from DHCD. Specifically, in FY10, a total of 48,377 sought out information and/or EA benefits from DHCD and of those:

- 32,798 families were screened (phone screening and walk-in)
- 11,147 families applied for shelter
- 4,432 families entered shelters[124]

Massachusetts Head Start/Early Head Start collects information on families they serve and in 2009, 1,000 families, or 7% of families enrolled were homeless and required housing assistance. Furthermore, 37% of those 1,000 families received other emergency/crisis intervention services.

Massachusetts also suffers from families trapped between the gap in assistance and the high cost of living in the state. The U.S. Department of Housing and Urban Development estimates the average income for a family of three in Massachusetts is $78,200,[125] and a person with two children must make an annual income of over $58,000 to attain a basic standard of living in unsubsidized housing in Boston.[126] Families living with household incomes below $58,000 struggle against the high costs of food and transportation in addition to a chronic shortage of low rent apartments. Many of these families have professional incomes well above the threshold to receive emergency assistance.[127]

Subsidized Food and School Lunch

The National School Lunch Program is a federally assisted meal program in over 101,000 public and non-profit private schools throughout the United States administered by the US Department of Agriculture.[128] In 2008, it provided nutritional, low-cost or free lunches to over 30.5 million children throughout the US every day. Children from families with incomes at or below 130% of the poverty level ($21,710 for a family of four) are eligible for free meals and those between 130% and 185% ($30,895 for a family of four) are eligible for reduced lunches at a price no more than forty cents.[129]

The Department of Elementary and Secondary Education (DESE) administers the School Lunch Program in Massachusetts and according to their 2009-2010 report, 5.6% of children received reduced lunch and 27.4% received free lunch across the Commonwealth.[130] This report presented data by school districts, which were then mapped to their corresponding cities and towns. The top five communities with the highest percentages of students receiving reduced lunches in the Commonwealth were:

1. Rowe (Berkshires): 16.9%
2. Provincetown (Cape & Islands): 15.8%
3. Somerville (Metro Boston): 14.1%
4. Revere (Northshore): 13.6%
5. Everett (Northshore): 13.4%

The top 5 communities with the highest percentages of students receiving free lunch were:

1. Chelsea (Northshore): 80.9%
2. Lawrence (Northeast): 79.6%
3. Springfield (Hampden County): 74.9%
4. Holyoke (Hampden County): 69.1%
5. Lynn (Northshore): 69.2%

Transitional Aid to Families with Dependent Children (TAFDC)

Transitional Aid to Families with Dependent Children (TAFDC) is a U.S. government program that provides cash and medical assistance to needy families with dependent children and pregnant women to help them with the basic necessities for their children. TAFDC is provided based on income, household size, housing situation, and work requirements. In Massachusetts, health insurance is provided through MassHealth.[131]

The Massachusetts Department of Transitional Assistance (DTA) administers TAFDC throughout the Commonwealth and in 2009, 6.6% of Massachusetts families received TAFDC assistance.[132] Upon further analysis, the five towns with the highest percentages of families receiving TAFDC assistance in 2009 were:

1. Holyoke (Hampden County) 30%
2. Springfield (Hampden County) 27%
3. New Bedford (Southeast) 20%
4. Chelsea (Northshore) 18%
5. Lawrence (Northeast) 16%

Access to Care

In addition to mapping primary care health professional shortage areas (HPSA), dental and mental health professional shortage areas underscore communities that may have less access to care.

Figure F.7: Primary Care Health Professional Shortage Areas (HPSAs)

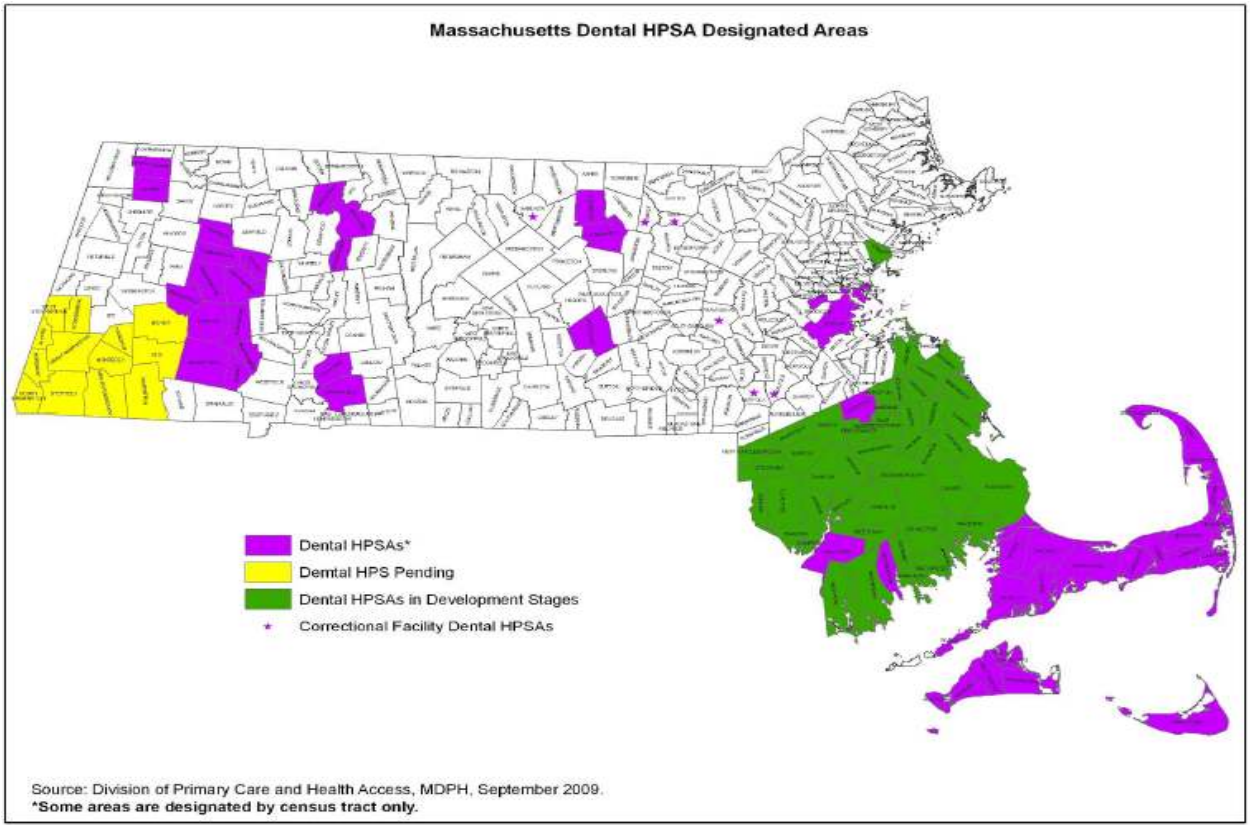
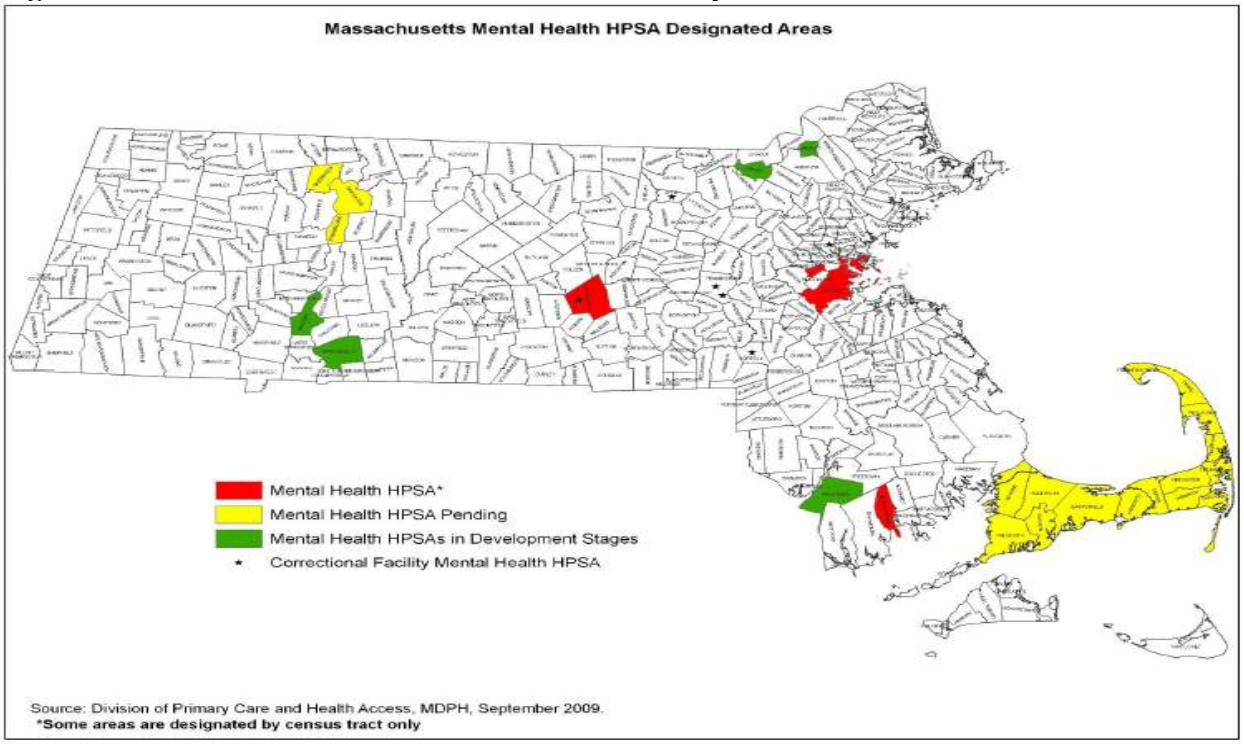


Figure F.9: Massachusetts Mental Health HPSA Map



Massachusetts HPSA Comparison
Based on HPSA designation, Massachusetts does better overall than the nation for percentage of the population living within an HPSA. Based on the September 2008 comparison, Massachusetts had 7.1% of the population living in a primary care health professional shortage area compared with 11.8% for the nation.[133] Dental health was comparably worse than primary care but still better than the national average (8.4% vs. 10.4%). Mental Health is significantly better than the national rate (0.7% vs. 18.7%).

In the Western region of the state, the geographic distances covered and natural barriers between communities result in limited access to services. A lack of transportation, as well as family and work-life needs, makes it difficult for many rural residents to travel to cities to receive services on a regular basis. For example, many communities in the Berkshires must cross a mountain range to visit the nearest secondary or tertiary care center or community health center. Similar to the Western region, the islands of Nantucket and Martha's Vineyard also have populations too small to support major medical facilities, and the year round community often has restricted access to mainland services in winter due to weather conditions and reduced ferry service.

Medical Home
A medical home is defined by the American Academy of Pediatrics (AAP) as a system of care that is accessible, continuous, comprehensive, family-centered, coordinated, compassionate, and culturally effective. It is an approach to providing health care services where families and physicians work together to identify and access all of the medical and non-medical services needed to help children and their families reach their maximum health potential. The medical home is also where families are recognized as the principal caregivers and the center of strength and support for their children. The Massachusetts Medical Society, the Massachusetts Chapter of the AAP, and the Massachusetts Academy of Family Physicians have formally endorsed the principles of the Medical Home Policy Statements of the AAP. According to data from the 2007 National Survey of Children's Health, 66.2% of Massachusetts children aged <18 years received care within a medical home (compared with 57.5% nationally).[134]

Data from the 2005/2006 NS-CSHCN provide information about several important aspects of medical homes for children with special health care needs:[135]

- The prevalence of systems of care meeting the criteria for being a medical home can still be improved, since only 47.1% do so nationally and 45.7% do so in Massachusetts
- In Massachusetts, most families report that their child has a usual source for both sick and well care (94.4%) and a personal doctor or nurse (96.4%)
- 86.1% have "no problem" with referrals (including 92.2% of recipients receiving publically funded health care)
- 68.8% received family-centered care (62.9% of recipients receiving publically funded health care received family-centered care)

- Of all children who needed care coordination, only 55% received coordinated care (compared with the national average of 59.2% and recipients' children receiving publically funded health care in Massachusetts, 60.9%)
- The prevalence of a medical home differed by race/ethnicity of the child, as children who were Hispanic or Black, non-Hispanic were less likely to have a medical home than those children who were White, non-Hispanic

Community Service Agencies

Community Service Agencies were started to support the efforts and implementation of the CBHI in Massachusetts. The Massachusetts Behavioral Health Partnership (MBHP) in conjunction with four MassHealth (Medicaid) contracted managed care organizations (MCO's): Boston Medical Center HealthNet Plan, Fallon Community Health Plan, Neighborhood Health Plan, and Network Health, to create a network of Community Service Agencies (CSA) throughout Massachusetts. A CSA is a community-based organization whose primary function is to ensure access to and facilitate the coordination of care for youth with serious emotional disturbance (SED).[136] Often these youth require multiple services and are involved with several child-serving systems (e.g., child welfare, special education, juvenile justice, mental health). Currently there are 26 CSA's that operate throughout Massachusetts, of which 23 are geographically consistent with the service areas for the Massachusetts child welfare agency, DCF. The additional 3 CSA's specifically address the cultural and linguistic needs of specialized target populations in the Commonwealth. All CSA's are required to be culturally competent and equipped to address specific needs of the youth and families they serve. It is important to note that CSA's that operate in overlapping geographically areas are expected to collaborate and pool resources to strengthen the services provided to families.

Community Service Agencies focus on:

- Actively connecting youth and families that are seeking Intensive Care Coordination (ICC) services and Caregiver Peer to Peer Support Service.
- Providing infrastructure support for ICC and Caregiver Peer to Peer Support services
- Actively participating in a continual quality improvement process to help identify the "lessons learned" from youth, families, providers, and others. By doing so, this process will ensure that the CSA's are adequately addressing the needs of the services provided to youth and families
- Developing and supporting a local Systems of Care Committee that supports the service area's efforts to create and sustain collaborations among families, community organizations, service providers, state agencies, faith-based groups, local schools, and other stakeholders.

Vulnerable Populations

Racial/Ethnic Minorities

The racial and ethnic make-up of Massachusetts has changed dramatically since the mid-twentieth century. In 1950, one out of 50 people was non-White; today, one in five is

non-White. According to 2008 American Community Survey 1-year population estimates, racial and ethnic minorities constituted 21.5% of the Massachusetts population (non-Hispanic Blacks 5.7%, Hispanics 8.6%, non-Hispanic Asians 4.9%, and two or more races 1.3%).[137] This is a change of 4% since 2000 with a nearly 2% overall increase in the portion of Hispanics. In 2000, minorities constituted 17% of the population (Non-Hispanic Blacks 5.5%, Hispanics 6.8%, Asians 3.8%, and two or more races 0.9%).

By 2010, Massachusetts' population is projected to increase moderately to 6,649,441 with minority populations continuing to account for a large portion of population growth. In several Massachusetts communities, including Boston, minority groups now constitute the majority of the population.

Unfortunately, in the Commonwealth, racial and ethnic differences often correlate with economic and health disparities. Minority populations in Massachusetts in many cases have a lower socioeconomic status and have less access to services, including preventative health services, opportunities for exercise, and access to healthy foods.

- 39% of those living below 100% FPL in Massachusetts are minorities, nearly twice as many as in the population as a whole
- 41% of Hispanics and 30% of blacks live under 100% FPL in Massachusetts

The high cost of living in the state presents challenges for low income and minority populations. Massachusetts has a lower proportion of the population living under 200% of the FPL compared with the nation (31% versus 36%), but it has a higher median annual household income. As a result, housing and food costs are higher than those in many other states. The challenge for low income individuals to maintain living standards in the state translates into decreased socio-economic mobility.

Massachusetts health care reform, especially as it relates to universal health insurance for all regardless of ability to pay, has enabled low income and minority populations to have dramatically improved access to health care services. However, the effect on disparities in health outcomes for minorities has yet to be fully measured. While health insurance is readily available, the demand on primary care has underscored primary care provider shortages. Further, much of the current health care system is unable to deal with the linguistic and cultural differences of many of the newly insured.

English Language Learners

English Language Learners and those with limited English proficiency represent a vulnerable population[138] and require consideration when determining levels of need for home visiting services. According to the 2000 US Census, 17.9% of the US population aged 5 years and older spoke a language other than English at home.[139]

DESE collects two indicators of non-English speaking students: 1) the percentage of enrolled students whose first language is not English, and 2) the percentage of student enrollees who have limited English proficiency, defined as "a student whose first language is a language other than English who is unable to perform ordinary classroom work in English."[140] Across the state, 15.6% of enrolled students are English Language Learners and 6.2% are limited in their English proficiency. Stratified and ranked by cities

and towns, the highest percentages of students who speak English as a second language are:

1. Chelsea (Northshore): 84.4%
2. Lawrence (Northeast): 79.1%
3. Holyoke (Hampden County): 50.9%
4. Lynn (Northshore): 50.7%
5. Somerville (Metro-Boston): 50.7%

The following cities and towns have the highest percentages of enrolled students who have limited English proficient:

1. Lowell (Northeast): 32.4%
2. Worcester (Central): 26.6%
3. Lynn (Northshore): 25.9%
4. Holyoke (Hampden County): 23.3%
5. Lawrence (Northeast): 23.1%

Immigrants

Population growth in Massachusetts over the last decade has been largely attributed to the immigration of minority racial and ethnic populations. This influx has contributed to increasing numbers of minority children and youth in the Commonwealth. These new populations reside primarily in urban areas. Massachusetts, Boston specifically, is one of the most ethnically diverse areas in the nation, with more than 100 ethnicities represented in its neighborhoods and 140 languages spoken in its homes.[141]

Massachusetts continues to rank 8th in the U.S. in its population of foreign-born persons.[142] The percentage of foreign-born residents increased from 12.2% to 14.2% between 2000 and 2007. According to a 2007 report from the Pew Hispanic Center, among foreign-born persons in Massachusetts:[143]

- 35% were from Latin America
- 27% were from Asia
- 27% were from Europe
- 7% were from Africa
- 4% were from North America

The large numbers of immigrants coming from Latin America, Asia, and Europe challenge health service providers to accommodate diverse linguistic and cultural backgrounds. The following chart presents the top five countries of origin based on world region of birth for Massachusetts residents.

Figure F.10: Top Countries of Origin by Region of Birth for Massachusetts Residents

World Region of Birth	Top 5 Countries	As % of Region
Europe	1. Portugal 2. Italy 3. United Kingdom	1. 26.8% 2. 11.4% 3. 10.2%

	4. Ireland 5. Russia	4. 7.2% 5. 7.0%
Asia	1. China 2. Vietnam 3. India 4. Cambodia 5. Korea	1. 19.5% 2. 15.1% 3. 13.9% 4. 6.8% 5. 6.7%
Africa	1. Western Africa (Other than Sierra Leone, Nigeria and Ghana) 2. Eastern Africa 3. Northern Africa 4. Sierra Leone 5. Ghana	1. 42.5% 2. 15.7% 3. 13.7% 4. 7.1% 5. 6.2%
Americas	1. Dominican Republic 2. Canada 3. Brazil 4. Haiti 5. El Salvador	1. 17.2% 2. 14.8% 3. 13.5% 4. 6.8% 5. 6.8%

Estimates of the number of immigrants and refugees, especially undocumented immigrants, vary due to the inherent difficulty in counting changing populations whose primary language is not English. These individuals often experience cultural isolation and are frequently reluctant to talk to outsiders, especially those with questions about immigration status. A PEW study estimated the undocumented immigrant population in the Commonwealth at 190,000, ranking the state as 14th in undocumented immigrants, directly behind Maryland, Colorado, and Nevada.[144]

Births to Foreign-born Mothers

While birth outcomes are often better for foreign-born mothers, women giving birth with low English proficiency or undocumented immigration status often face challenges accessing resources for themselves and their children after birth. The percentage of births to non-U.S. born mothers in 2008 was 27.7%.[145]

Of the 51,760 births to White, non-Hispanic women in Massachusetts in 2008:

- 13.0% were to women born in countries other than the US
- 0.2 % were to women born in the U.S. Territories

Among the 10,895 births to Hispanic mothers:

- 47.4% were to foreign-born women
- 17.1% were to women born in the U.S. Territories

Among the 6,652 births to Black, non-Hispanic mothers:

- 51.3% were to foreign-born women
- 0.2% were to women born in the U.S. Territories

Among the 5,958 births to Asian women:

- 86.2.0% were to foreign-born women

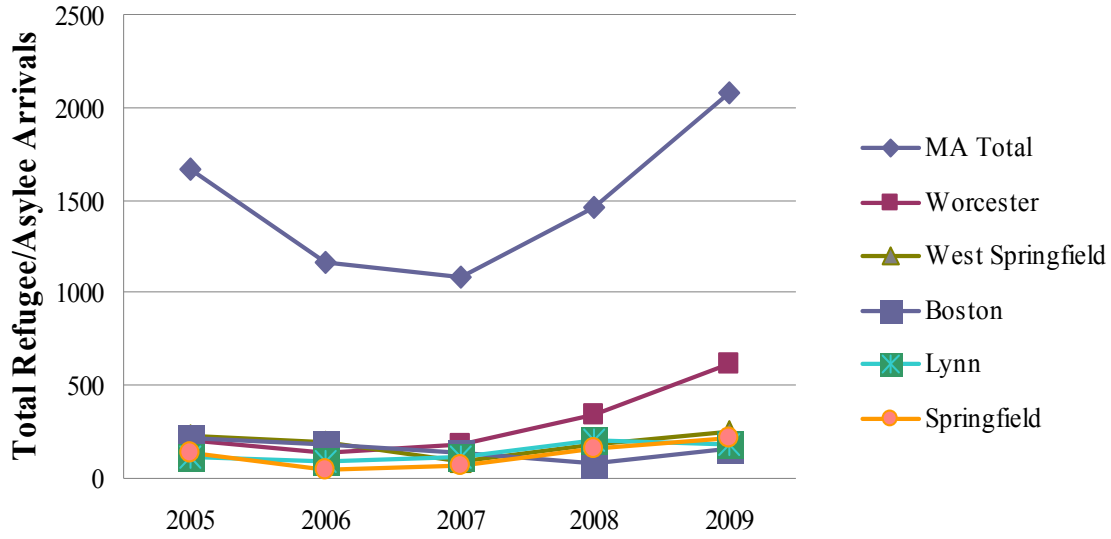
Among the 1,562 births to mothers who designated themselves as American Indian or other race:

- 57.2% were to non-U.S.-born women

Refugees and Asylees

During 2005-2009, there were a total of 7,459 refugee/asylee arrivals in Massachusetts.[146] These data represent a steady increase in arrivals into the state since 2007. The cities of Worcester, West Springfield, Boston, Lynn and Springfield had the greatest number of arrivals during this five year period, totaling 4,550 refugees/asylees. These five cities account for half of the total arrivals in the state.

Figure F.11: Trend of Refugee/Asylee Arrivals 2005-2009



Healthy Start

The Healthy Start Program is a component of MassHealth, the state's Medicaid program, and provides health insurance to low income, uninsured pregnant women. Its goal is to improve access to early, comprehensive, and continuous prenatal care and to improve the health of newborns and their mothers. Since immigration status does *not* restrict eligibility for the program, the bulk of Healthy Start clients tend to be undocumented. The Healthy Start Program provides coverage for the following pregnancy-related services:

- Pregnancy-related primary and specialty visits
- Outpatient behavioral health visits
- Prescriptions
- Pregnancy-related radiology and laboratory services

- Amniocentesis
- Prescribed durable medical equipment, up to $300 per pregnancy
- Home nursing postpartum visits (limited to two visits for pregnancies without complications or five visits for pregnancies with complications or C-sections)
- Office visits, including family planning
- Postpartum obstetric and gynecological care
- Newborn hospital and outpatient care including one postpartum pediatric ambulatory visit

Individuals enrolled in Healthy Start are also eligible for MassHealth Limited, which covers emergency services including inpatient labor and delivery and emergency transportation. In addition, Healthy Start members are eligible for the Health Safety Net (HSN), which covers some other medically necessary services at Massachusetts acute hospitals and community health centers for services not covered by the Healthy Start Program.

To be eligible for Healthy Start, an applicant must be a pregnant women, be a Massachusetts resident, have no other health insurance coverage that pays for all medically necessary pregnancy-related care as offered by HSP, must not be eligible for MassHealth (except MassHealth limited), and must have a family income less than or equal to 200% of the federal poverty level.

As of June 30th, 2010, there were a total of 3,890 women enrolled in the Healthy Start Program throughout Massachusetts.[147] This highlights the large numbers of at-risk undocumented pregnant women in Massachusetts. Boston, Lynn, Chelsea, Framingham and Worcester were the top five cities with the greatest number of clients, totaling 1,272 women. These cities make up a third of the total state caseload.[148]

Armed Forces

Active military and veterans represent another vulnerable population in Massachusetts. Studies have shown that major depression, generalized anxiety, and PTSD were significantly higher among those exposed to combat than before deployment.[149] [150] Additionally, adverse outcomes frequently experienced by spouses and children of active duty military include parental distress, increased child depression, anxiety, and externalizing symptoms.[151] Women whose husbands were deployed are more likely to experience depressive disorders, anxiety, and acute stress reaction and adjustment disorders.[152] These adverse outcomes remain even after the deployed parent returns, indicating a need for prevention, screening, and intervention services. Research also shows an increased rate of child maltreatment in military families, [153] which has direct implications for home visiting services.

From the most recent population data of the 2000 census, Massachusetts had 5,422 people in the Armed Forces, or 0.11% of all persons aged 18 years and older.[154] The highest concentration of Armed Forces by far was in Lincoln, MA (14.02%). Other Massachusetts cities and towns with high percentages of Armed Forces include: Bourne

(3.08%); Bedford (1.55%), which is the location of Hanscom Air Force Base; and Nantucket (1.21%).

Civilian Veterans

According to 2000 Census data, there were 558,933 veterans in the Commonwealth, representing 11.5% of the population.[155] The cities and towns with the highest percentages of veterans include: Mount Washington (24.14%), Sandisfield (22.44%), Eastham (21.63%), Chatham (21.51%), and Gosnold (21.31%).

Female Veterans

Due to post-2000 military operations in Iraq and Afghanistan, Massachusetts also collected data from the American Community Survey to obtain additional data to inform the Home Visiting Needs Assessment. Specifically, Massachusetts collected information on female Veteran populations. Survey data from 2006-2008 revealed that Brockton (22.2/1,000), Worcester (15.4/1,000), Lynn (9.8/1,000), Springfield (9.2/1,000), and Fall River (5.6/1,000) had the highest rates of female veterans in the Commonwealth.[156] These data provide important information which will help to inform the process of addressing the vulnerability of military and veteran populations.

References

1 Misra DP, Guyer B. Benefits and limitations of prenatal care. Journal of the American Medical Association 1998; 280:2073.

2 Massachusetts Pregnancy Risk Assessment Monitoring System (PRAMS). Draft 2007/2008 Surveillance Report.

3 Massachusetts Community Health Information Profile (MassCHIP): Massachusetts Department of Public Health (Version 3.0) [Software]. Birth (Vital Records): Total Births, Mothers receiving intermediate, inadequate, or no prenatal care. (2004-2008). Retrieved from http://www.mass.gov/dph/masschip

4 Gartner LM, Morton J, Lawrence RA, Naylor AJ, O'Hare D, Schanler RJ et al. Breastfeeding and the use iof human milk. Pediatrics 2005; 155, 496-506..

5 Centers for Disease Control and Prevention. 2008 Pediatric Nutrition Surveillance. Tables 2C: Massachusetts Summary of Health Indicators – Children Aged < 5 Years. February 2009.

6 Centers for Disease Control and Prevention. 2008 Pediatric Nutrition Surveillance. Tables 13C: Massachusetts Summary of Trends in Breastfeeding – Children Aged < 5 Years. February 2009.

7 Massachusetts Pregnancy Risk Assessment Monitoring System (PRAMS). Draft 2007/2008 Surveillance Report.

8 Massachusetts Community Health Information Profile (MassCHIP): Massachusetts Department of Public Health (Version 3.0) [Software]. Birth (Vital Records): Total Births, Mothers not intending to breastfeed at delivery. (2004-2008). Retrieved from http://www.mass.gov/dph/masschip

9 DiFranza, J,R.& Lew, R.A. (1995). Effect of maternal cigarette smoking on pregnancy complications and sudden infant death syndrome. J.Fam.Pract.,40, 385-394

10 Massachusetts Department of Public Health, Health Survey Program, Bureau for Health Information, Statistics, Research and Evaluation. 2006-2008 Behavioral Risk Factor Surveillance System (BRFSS) data.

11 Massachusetts Department of Public Health, Health Survey Program, Bureau for Health Information, Statistics, Research and Evaluation. 2006-2008 Behavioral Risk Factor Surveillance System (BRFSS) data.

12 Massachusetts Births 2008. Boston, MA: Division of Research and Epidemiology, Bureau of Health Information, Statistics, Research and Evaluation, Massachusetts Department of Public Health. February 2009.

13 Massachusetts Births 2008. Boston, MA: Division of Research and Epidemiology, Bureau of Health Information, Statistics, Research and Evaluation, Massachusetts Department of Public Health. February 2009.

14 Massachusetts Department of Public Health, Bureau of Family Health and Nutrition, Office of Data Translation. Massachusetts Pregnancy and Risk Assessment Monitoring System, (PRAMS) 2008. (pre-publication edition)

15 Massachusetts Community Health Information Profile (MassCHIP): Massachusetts Department of Public Health (Version 3.0) [Software]. Birth (Vital Records): Total Births, Maternal cigarette smoking during pregnancy. (2004-2008). Retrieved from http://www.mass.gov/dph/masschip

16 Massachusetts Community Health Information Profile (MassCHIP): Massachusetts Department of Public Health (Version 3.0) [Software]. Birth (Vital Records): Total Births, Maternal cigarette smoking during pregnancy. (2004-2008). Retrieved from http://www.mass.gov/dph/masschip

17 Massachusetts Department of Public Health, Health Survey Program, Bureau for Health Information, Statistics, Research and Evaluation. 2006-2008 Behavioral Risk Factor Surveillance System (BRFSS) data.

18 Massachusetts Pregnancy Risk Assessment Monitoring System (PRAMS). Draft 2007/2008 Surveillance Report.

19 Massachusetts Department of Public Health, Health Survey Program, Bureau for Health Information, Statistics, Research and Evaluation. 2006 Behavioral Risk Factor Surveillance System (BRFSS) data. Accessed October 2009 via MassCHIP v3.00r323..

20 Massachusetts Department of Public Health, Health Survey Program, Bureau for Health Information, Statistics, Research and Evaluation. 2006 Behavioral Risk Factor Surveillance System (BRFSS) data. Accessed October 2009 via MassCHIP v3.00r323..

21 Massachusetts Department of Public Health, Health Survey Program, Bureau for Health Information, Statistics, Research and Evaluation. 2006 Behavioral Risk Factor Surveillance System (BRFSS) data

22 Massachusetts Title V Needs Assessment, Bureau of Family Health and Nutrition, 2010

23 Massachusetts Community Health Information Profile (MassCHIP): Massachusetts Department of Public Health (Version 3.0) [Software]. Substance Abuse (BSAS) DPH Funded Program Utilization: Substance abuse admissions (pregnant). (2008). Retrieved from http://www.mass.gov/dph/masschip

24 Sokol, R. J., Aney-Black, V., & Nordstrom, B. (2003). Fetal alcohol spectrum disorder. JAMA, 290, 2996-2999

25 Massachusetts Department of Public Health. Bureau of Substance Abuse services management Information System in FY 2008. Substance Abuse Fact Sheet: Pregnant Women Admissions. Boston: Massachusetts Department of Public Health; 2009.

26 Behavioral Risk Factor Surveillance System (BRFSS): 2006-2008. Boston, MA: Bureau of Health Statistics, Research and Evaluation, Massachusetts Department of Public Health.

27 Massachusetts Pregnancy Risk Assessment Monitoring System (PRAMS). Draft 2007/2008 Surveillance Report.

28 Massachusetts Births 2008. Boston, MA: Division of Research and Epidemiology, Bureau of Health Information, Statistics, Research, and Evaluation, Massachusetts Department of Public Health. March 2010. Note: Unless otherwise noted, all Massachusetts 2008 birth data as well as comparable 1990 to 2007 Massachusetts and 2007 national figures are from this source.

29 Massachusetts Births 2008. Boston, MA: Division of Research and Epidemiology, Bureau of Health Information, Statistics, Research, and Evaluation, Massachusetts Department of Public Health. March 2010. Note: Unless otherwise noted, all Massachusetts 2008 birth data as well as comparable 1990 to 2007 Massachusetts and 2007 national figures are from this source.

30 Rawling JS, Rawlings VB, Read JA. Prevalence of low birthweight and preterm delivery in relation to the interval between pregnancies among white and black women. N Engl J Med. 1995; 332 (2): 69-74.

31 Basso O, Olsen J, Knudsen LB, Christensen K. Low birthweight and preterm after short interpregnancy intervals. Am J Obs Gyn. 1998;178 (2): 259-63.

32 Todoroff K, Shaw GM. Prior spontaneous abortion, prior elective termination, interpregnancy interval and risk of neural tube defects. Am J Epi. 2000; 200 (151): 505-11

33 Esposito MA, Menihan CA, Malee MP. Association of interpregnancy intervals with uterine scar failure in labor: A case control study. Am J Obstet Gynecol. 2000; 183: 1180-3.

34 Division of Research and Epidemiology, Bureau of Health Information, Statistics, Research, and Evaluation. (2010). Massachusetts Births 2008 (Pregnancy-Associated Mortality Ratio). Boston, MA: MA Department of Public Health.

35 Nannini, Angela. Presentation: Identifying Pregnant and Postpartum Women with Mental Health and Substance Abuse Disorders using Linked Hospital Visit Data. October 29, 2008.

36 Nannini, Angela. Presentation: Identifying Pregnant and Postpartum Women with Mental Health and Substance Abuse Disorders using Linked Hospital Visit Data. October 29, 2008.

37 Logsdon MC, Wisner KL, Pinto-Foltz MD. The impact of post-partum depression on mothering. Journal of Obstetric and Gynecological Neonatal Nursing 2006;35: 652-658.

38 Massachusetts Pregnancy Risk Assessment Monitoring System (PRAMS) 2007/2008 Surveillance Report. Massachusetts Department of Public Health, Bureau of Family Health and Nutrition, Office of Data Translation.

39 Behavioral Risk Factor Surveillance System (BRFSS). Boston, MA: Bureau of Health Statistics, Research and Evaluation, Massachusetts Department of Public Health. Accessed October 2009 via MassCHIP v3.00 r323.

40 Nannini, Angela. Presentation: Identifying Pregnant and Postpartum Women with Mental Health and Substance Abuse Disorders using Linked Hospital Visit Data. October 29, 2008.

41 Massachusetts Community Health Information Profile (MassCHIP): Massachusetts Department of Public Health (Version 3.0) [Software]. Uniform Hospital Discharge Dataset System: Massachusetts Division of Health Care Finance and Policy (2005-2007). Retrieved from http://www.mass.gov/dph/masschip

42 Burden of Asthma in Massachusetts. Massachusetts Department of Public Health, Asthma Prevention and Control Program, April 2009.

43 Pediatric Asthma in Massachusetts 2006 – 2007. Massachusetts Department of Public Health, Bureau of Environmental Health, April 2009.

44 Burden of Asthma in Massachusetts. Massachusetts Department of Public Health, Asthma Prevention and Control Program, April 2009

45 Burden of Asthma in Massachusetts. Massachusetts Department of Public Health, Asthma Prevention and Control Program, April 2009

46 Burden of Asthma in Massachusetts. Massachusetts Department of Public Health, Asthma Prevention and Control Program, April 2009

47 Massachusetts Community Health Information Profile (MassCHIP): Massachusetts Department of Public Health (Version 3.0) [Software]. Asthma Prevention and Control Program (Hospitalizations due to Asthma). (2008). Retrieved from http://www.mass.gov/dph/masschip

48 Massachusetts Department of Public Health, Childhood Lead Poisoning Prevention Program. www.mass.gov/dph/clppp.

49 Massachusetts Department of Public Health, Childhood Lead Poisoning Prevention Program. www.mass.gov/dph/clppp.

50 CDC's State Surveillance Data. Number of Children Tested and Confirmed EBLLs by State, Year, and BLL Group, Children < 72 Months Old: Data for Massachusetts. http://www.cdc.gov/nceh/lead/data/PbNationalData.htm#Massachusetts.

51 CDC MA Lead Data, Statistics, and Surveillance, 2006.

52 Ibid.

53 Childhood Lead Poisoning Screening and Incidence Statistics by Community, MDPH, 2008.

54 Centers for Disease Control and Prevention. 2009 Pediatric Nutrition Surveillance. 2009.

55 2008-2009 Head Start Program Information Report (PIR), Health Services Report – State Level (6/24/10)

56 MassHealth Data, July 2010

57 Zeanah P, Stafford B, Nagle G, Rice T. Addressing Social-Emotional Development and Infant Mental Health in Early Childhood Systems. In: Bulding State Early Childhood Comprehensive Systems Series, No. 12: National Center for Infant and Early Childhood Health Policy; 2005.

58 Shonkoff JP, Phillips DA, editors. From Neurons to Neighborhoods: The Science of Early Childhood Development. Washington, DC: National Academy Press; 2000.

59 National Scientific Council on the Developing Child. Excessive stress disrupts the architecture of the developing brain. Working Paper. Waltham, MA: The Heller School, Brandeis University; 2005. Report No.: 3.

60 National Scientific Council on the Developing Child. (2005) Excessive Stress Disrupts the Architecture of the Developing Brain. Working Paper No. 3. http:///www.developingthechild.net/reports.shtml

61 Vreicker T., Macomber J., Golden O. Infants of depressed mothers living in poverty: opportunities to identify and serve. Washington, DC: The Urban Institute, 2010. Issue Brief 1.

62 Felitti VJ, Anda RF, Nordenberg D, Williamson DF, Spitz AM, Edwards V, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. Am J Prev Med 1998;14(4):245-58.

63 Shonkoff JP, Phillips DA, editors. From Neurons to Neighborhoods: The Science of Early Childhood Development. Washington, DC: National Academy Press; 2000.

64 National Scientific Council on the Developing Child. Excessive stress disrupts the architecture of the developing brain. Working Paper. Waltham, MA: The Heller School, Brandeis University; 2005. Report No.: 3.

65 Chronicity of maternal depressive symptoms, maternal sensitivity, and child functioning at 36 months. NICHD Early Child Care Research Network. Dev Psychol 1999;35(5):1297-310.

66 Petterson SM, Albers AB. Effects of poverty and maternal depression on early child development. Child Dev 2001;72(6):1794-813.

67 Dawson G, Frey K, Panagiotides H, Osterling J, Hessl D. Infants of depressed mothers exhibit atypical frontal brain activity: a replication and extension of previous findings. J Child Psychol Psychiatry 1997;38(2):179-86.

68 Weinberg MK, Tronick EZ. Emotional characteristics of infants associated with maternal depression and anxiety. Pediatrics 1998;102(5 Suppl E):1298-304.

69 Zuckerman BS, Beardslee WR. Maternal depression: a concern for pediatricians. Pediatrics 1987;79(1):110-7.

70 Goodman SH, Gotlib IH. Risk for psychopathology in the children of depressed mothers: a developmental model for understanding mechanisms of transmission. Psychol Rev 1999;106(3):458-90.

71 Murray L, Woolgar M, Cooper P, Hipwell A. Cognitive vulnerability to depression in 5-year-old children of depressed mothers. J Child Psychol Psychiatry 2001;42(7):891-9.

72 Black MM, Papas MA, Hussey JM, Hunter W, Dubowitz H, Kotch JB, et al. Behavior and development of preschool children born to adolescent mothers: risk and 3-generation households. Pediatrics 2002;109(4):573-80

73 CA: National Center for Infant and Early Childhood Health Policy at UCLA

Zero to Three Policy Center; AMCHP; Johns Hopkins Bloomberg School of Public Health, Women's and Children's Health Policy Center; 2005.

74 Zeanah, C. (2009). Handbook of Infant Mental Health, 3rd Ed. New York: Guilford Press.

75 Upshur, C., & Wenz-Gross, W. (2004, January). Together For Kids Second Year Report.

76 2008-2009 Head Start Program Information Report (PIR), Health Services Report – State Level (6/24/10)

77 Knitzer, J. & Page, S. (1996). Map and track: State initiatives for young children and their families. New York: National Center for Children in Poverty. Columbia University.

78 United Way of Massachusetts Bay and Merrimack Valley survey

79 United States District Court, District of Massachusetts, Western Division. Rosie D. et al. v. Patrick. Available at: http://www.mass.gov/Eeohhs2/docs/masshealth/research/child_bh-hlthjudgement.pdf

80 SFY 11 Massachusetts State Plan Update: Children's Behavioral Health Initiative Screening Rates.. Boston, MA: Massachusetts Department of Mental Health. 2010.

81 Planning, Research, Evaluation & Accountability Reporting Group. (2010). Poor performing schools, 2008. Framework for District Accountability and Assistance 2010-2011. Boston, MA: MA Department of Elementary and Secondary Education.

82 Planning, Research, Evaluation & Accountability Reporting Group. (2010). Poor performing schools, 2008 Level 4 Schools: Information for Parents and the Public. Boston, MA: MA Department of Elementary and Secondary Education.

83 Henry, KL. Who's Skipping School: Characteristics of Truants in 8th and 10th Grade. Journal of School Health. 2007; 77(1): 29-35.

84 Ibid.

85 Ibid.

86 2008-2009 School and District Profiles. Boston, MA: MA Department of Elementary and Secondary Education: 2008-2009.

87 Percentage of children (0-11) waitlisted for an EEC subsidized childcare slot (custom report).Boston, MA: MA Department of Early Education and Care.

88 Report to the Legislature: Students with Disabilities Annual Report 2008-2009. Massachusetts Department of Elementary and Secondary Education.

89 Report to the Legislature: Students with Disabilities Annual Report 2008-20089. Massachusetts Department of Elementary and Secondary Education, December 2009.

90 Report to the Legislature: Students with Disabilities Annual Report 2008-2009. Massachusetts Department of Elementary and Secondary Education.

91 Morrongiello BA, Klemencic N, Corbett M. Interactions between child behavior patterns and parent supervision: implications for children's risk of unintentional injury. Child Dev. 2008;79(3):627-638.

92 Morrongiello BA, Klemencic N, Corbett M. Interactions between child behavior patterns and parent supervision: implications for children's risk of unintentional injury. Child Dev. 2008;79(3):627-638.

93 Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Office of Statistics and Programming. 10 Leading Causes of Nonfatal Unintentional Injury, United States: 2007, All Races, both Sexes, Disposition: All Cases. 2007. 2010.

94 MA Division of Health Care Finance & Policy. (2008). Inpatient Hospital, Outpatient Observation Stay, and Emergency Department Discharge Databases, Inpatient Hospitalizations, Observation Stays and Emergency Department Discharges Associated with Unintentional Injury (Summed), MA Residents 0-9 Years. Boston, MA: MA Department of Public Health.

95 Massachusetts Community Health Information Profile (MassCHIP): Massachusetts Department of Public Health (Version 3.0) [Software]. (2008). Infant mortality rates: Linked births/deaths (Vital Records) ICD 10. Retrieved from http://www.mass.gov/dph/masschip

96 Massachusetts Department of Children and Families, 2007 Analysis of Child Fatalities and Near Fatalities. January, 2010.

97 Ibid.

98 Astone, NM, McLanahan, SS. Family Structure, Parental Practices and High School Completion. Am Soc Review. 1991; 56 (June: 309-320).

99 Fergusson DM, PhD; Boden M, PhD; Horwood L J, MSc. Exposure to Single Parenthood in Childhood and Later Mental Health, Educational, Economic, and Criminal Behavior Outcomes. Arch Gen Psychiatry. 2007;64(9):1089-1095

100 Mulkey, LM,Crain RL, Harrington, AJC. One-Parent Households and Achievement: Economic and Behavioral Explanations of a Small Effect. Sociology of Education, Vol. 65, No. 1 (Jan., 1992), pp. 48-65.

101 Fergusson DM, PhD; Boden M, PhD; Horwood L J, MSc. Exposure to Single Parenthood in Childhood and Later Mental Health, Educational, Economic, and Criminal Behavior Outcomes. Arch Gen Psychiatry. 2007;64(9):1089-1095

102 Massachusetts Community Health Information Profile (MassCHIP): Massachusetts Department of Public Health (Version 3.0) [Software].]. US Census 2000: Living Arrangements, Children <18: Own Child of Single Male Householder and Own Child of Single Female Householder. (2000).Retrieved from http://www.mass.gov/dph/masschip

103 U.S. Department of Commerce, U.S. Census Bureau. Data Showing relationship Between Education and Earnings. 2009.

104 Elo IT, Preston SH. Educational differentials in mortality: United States, 1979-1985. Soc.Sci.Med. 1996;42(1):47-57.

105 Elo IT, Preston SH. Educational differentials in mortality: United States, 1979-1985. Soc.Sci.Med. 1996;42(1):47-57.

106 Mouw T, Koster A, Wright ME, Blank MM, Moore SC, Hollenbeck A, et al. Education and risk of cancer in a large cohort of men and women in the United States. PLoS ONE 2008;3(11).

107 Davis-Kean PE. The influence of parent education and family income on child achievement: The indirect role of parental expectations and the home environment. Journal of Family Psychology 2005;19(2):294.

108 Massachusetts Community Health Information Profile (MassCHIP): Massachusetts Department of Public Health (Version 3.0) [Software].]. US Census 2000: Living Arrangements, Children <18: Own Child of Single Male Householder and Own Child of Single Female Householder. (2000).Retrieved from http://www.mass.gov/dph/masschip

109 Massachusetts Births 2008. Boston, MA: Division of Research and Epidemiology, Bureau of Health Information, Statistics, Research and Evaluation, Massachusetts Department of Public Health. March 2010.

110 Martin JA, Hamilton BE, Sutton PD, Ventura SJ, et al. Births: Final data for 2006. National Vital Statistics Reports; vol 57 no 7. Hyattsville, MD: National Center for Health Statistics. 2009.

111 Massachusetts Births 2008. Boston, MA: Division of Research and Epidemiology, Bureau of Health Information, Statistics, Research and Evaluation, Massachusetts Department of Public Health. March 2010.

112 Massachusetts Community Health Information Profile (MassCHIP): Massachusetts Department of Public Health (Version 3.0) [Software]. (2004-2008). Teen Birth Rate. (Vital Records) ICD 10. Retrieved from http://www.mass.gov/dph/masschip

113 Massachusetts Community Health Information Profile (MassCHIP): Massachusetts Department of Public Health (Version 3.0) [Software]. Population File: Census Counts (2005). Retrieved from http://www.mass.gov/dph/masschip

114 Massachusetts Births 2008. Boston, MA: Division of Research and Epidemiology, Bureau of Health Information, Statistics, Research, and Evaluation, Massachusetts Department of Public Health. March 2010.

115 http://www.whitehouse.gov/the_press_office/ObamaAnnouncesWhiteHouseOfficeofFaith-basedandNeighborhoodPartnerships/

116 http://fatherhood.hhs.gov/2006Initiative/index.shtml

117 National Resource Center on Children and Families of the Incarcerated (NRCCFI). Children and Families of the Incarcerated Fact Sheet. 2010. http://fcnetwork.org/wp/wp-content/uploads/fact-sheet.pdf

118 Male and Female Criminally Sentenced Inmates Self-Reporting Children and a Last Known Address in Massachusetts. Boston, MA: MA Department of Corrections Inmate Management System.

119 Massachusetts Community Health Information Profile (MassCHIP): Massachusetts Department of Public Health (Version 3.0) [Software]. Natality (Vital Records): Delivery Payment Source. (2004-2008). Retrieved from http://www.mass.gov/dph/masschip

120 Massachusetts department of Education, 2007

121 One Family Inc. http://www.onefamilyinc.org/research/why_homeless.shtml (Accessed 9/2010)

122 Massachusetts Coalition for the Homeless. http://www.mahomeless.org/advocacy/FY'11/FY11%20EA%20Ten%20Point%20Plan%20May%2014.pdf (Accessed 9/2010).

123 Number of families seeking information and/or EA benefit at DHCD offices (FY11) (custom report. Boston, MA: MA Department of Housing and Community Development.

124 Birth Defects Surveillance & F.O.R. Families Programs, Massachusetts Department of Public Health

125 FY08 Housing and Urban Development (HUD) Income Limits, available at: http://www.huduser.org/portal/datasets/il/il08/FY08_StateIncomeLimits.pdf

126 The Self-Sufficiency Standard for MA, MassFESS, 2006.

127 One Family Inc. http://www.onefamilyinc.org/research/why_homeless.shtml (Accessed 9/2010)

128 National School Lunch Program. http://www.fns.usda.gov/cnd/lunch/aboutlunch/NSLPFactSheet.pdf (Accessed 8/2010)

129 Massachusetts Department of Elementary and Secondary Education. Nutrition, Health and Safety: National School Lunch Programs. http://www.doe.mass.edu/cnp/nprograms/nslp.html# (Accessed 8/2010).

130 2009-2010 School and District Profiles. Boston, MA: MA Department of Elementary and Secondary Education.

131 Transitional Aid to Families with Dependent Children: An Overview. http://www.massresources.org/pages.cfm?contentID=17&pageID=4&Subpages=yes (Accessed 8/2010)

132 Massachusetts Community Health Information Profile (MassCHIP): Massachusetts Department of Public Health (Version 3.0) [Software Department of Transitional Assistance (DTA): Recipients of Temporary Aid for Families with Dependent Children (TAFDC). (2009). Retrieved from http://www.mass.gov/dph/masschip

133 U.S. Census Bureau, 2008 American Community Survey, Table R1501

134 Child and Adolescent Health Measurement Initiative. [National Survey of Children's Health, 2007]. Data Resource Center on Child and Adolescent Health website. Retrieved [08/2010] from [http://www.nschdata.org].

135 U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau. The National Survey of Children with Special Health Care Needs Chartbook 2005–2006. Rockville, Maryland: U.S. Department of Health and Human Services, 2008.

136 Massachusetts Behavioral Partnership. http://www.masspartnership.com/Provider/index.aspx?lnkid=CSARequestForResponse.ascx. (Accessed 9/2010).

137 2008 American Community Survey 1-Year Estimates. Available at: http://factfinder.census.gov/servlet/ADPTable?_bm=y&-geo_id=04000US25&-qr_name=ACS_2008_1YR_G00_DP5&-context=adp&-ds_name=&-tree_id=308&-_lang=en&-redoLog=false&-format=

138 Stevens GD, Seid M, Halfon N. Enrolling vulnerable, uninsured but eligible children in public health insurance: association with health status and primary care access. Pediatrics 2006;117(4):e751.

139 U. S. Census Bureau, 2000 Census of Population and Housing, Demographic Profile. Updated every 10 years. http://factfinder.census.gov

140 MA Department of Elementary and Secondary Education: Massachusetts School and District Profiles: 2009-10 Report.

141 Boston Initiative: http://www.bostonfoundation.org/indicators2004/civichealth/index.asp (Accessed 09/2010).

142 Massachusetts Department of Elementary and Secondary Education (MDESE), State Profile, 2008.

143 The Boston Foundation: Boston Indicators Project, http://www.bostonindicators.org/IndicatorsProject/IndicatorPopup.aspx?id=3218&dlIdx=6&vd=1

144 MDESE, State Profile, 2008

145 Massachusetts Births 2008. Boston, MA: Division of Research and Epidemiology, Bureau of Health Information, Statistics, Research, and Evaluation, Massachusetts Department of Public Health. March 2010. Note: Unless otherwise noted, all Massachusetts 2008 birth data as well as comparable 1990 to 2007 Massachusetts and 2007 national figures are from this source.

146 Refugee and Immigrant Health Program. (2005-2009). Refugee arrivals in MA by country of origin. Boston, MA: MA Department of Public Health.

147 Personal communication with Barbara McMullen, Ass't Director Preventive Health Services, PCC Plan, Mass Health , September 2010.

148 Healthy Start Program, MA.

149 Hoge CW, Castro CA, Messer SC, McGurk D, Cotting DI, Koffman RL. Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. N.Engl.J.Med. 2004;351(1):13.

150 Smith B, Smith TC, Ryan MA, Boyko EJ, Wells TS, LeardMann CA, et al. A Prospective Study of Depression Following Combat Deployment in Support of the Wars in Iraq and Afghanistan. 2010.

151 Lester P, Peterson K, Reeves J, Knauss L, Glover D, Mogil C, et al. The long war and parental combat deployment: effects on military children and at-home spouses. J.Am.Acad.Child Adolesc.Psychiatry 2010;49(4):310-320.

152 Mansfield AJ, Kaufman JS, Marshall SW, Gaynes BN, Morrissey JP, Engel CC. Deployment and the use of mental health services among US Army wives. N.Engl.J.Med. 2010;362(2):101.

153 Rentz ED, Marshall SW, Loomis D, Casteel C, Martin SL, Gibbs DA. Effect of deployment on the occurrence of child maltreatment in military and nonmilitary families. Am.J.Epidemiol. 2007.

154 Massachusetts Community Health Information Profile (MassCHIP): Massachusetts Department of Public Health (Version 3.0) [Software]. Population File: Percentage of Armed Forces. (2000). Retrieved from http://www.mass.gov/dph/masschip

155 Massachusetts Community Health Information Profile (MassCHIP): Massachusetts Department of Public Health (Version 3.0) [Software]. Population File: Percentage of civilian Veterans. (2000). Retrieved from http://www.mass.gov/dph/masschip

156 US Census Bureau: American Community Survey (2005). Percentage of female Veterans in Massachusetts (2005). Retrieved from http://www.census.gov/acs/www/